

**SITE ASSESSMENT REPORT**

**CORRECTIVE ACTION**

**AT**

**UNGALIK AIRSTRIP DRUM SPILL SITE**

**UNGALIK, ALASKA**

**MARCH 2013**

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## LIST OF ACRONYMS

ADEC – Alaska Department of Environmental Conservation  
BLM – Bureau of Land Management  
COC – contaminant(s) of concern  
CSM – conceptual site model  
Cy – cubic yards  
DU – decision unit  
FSG – Alaska Department of Environmental Conservation Draft Field Sampling Guidance Document dated May, 2010  
Ft bgs – feet below ground surface  
g – gram or grams  
MI – multi incremental  
**NORTECH** – **NORTECH** Environment, Energy, Health & Safety Consultants  
SAP – sampling and analysis plan  
SAR – site assessment report  
SGS – SGS Environmental Services





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## **1.0 EXECUTIVE SUMMARY**

**NORTECH** Environmental Engineering and Industrial Hygiene (**NORTECH**) completed this Corrective Action for the United States, Bureau of Land Management's (BLM) Ungalik Airstrip Drum Spill Site Hazmat Removal Project (Contract #GS10F0150R) during Site work in September of 2012.

In 1993, an estimated 150 drums were reported to be found on the south end of the airstrip as well as scattered around the site. In 1995 the BLM noted that most of the drums were empty, but some were filled with fuel and some were leaking. In 2003 and 2004, the BLM, in conjunction with a nearby privately owned mining property and several residents of Shaktoolik, removed the drums from the site. A final count of 71 empty drums and 54 drums containing diesel fuel #2 were removed from the site and taken to Shaktoolik for disposal.

In August 2007, Ecology and Environment, Inc. performed a Limited Site Characterization and identified four areas of concern. Field screening and soil sampling indicated diesel contamination of up to 59,400 milligrams per kilogram (mg/kg) located at the south end of the airstrip.

In 2008, MACTEC and their subcontractor used Geoprobe equipment to delineate the contaminated areas, and to determine if groundwater was present to determine the appropriate cleanup criteria. Four separate areas were determined to require remediation. This Corrective Action has focused on the areas as identified in these previous investigations.

**NORTECH** performed Site Corrective Action during September 2012, by excavating the areas identified as contaminated during previous site work by Ecology and Environment and MACTEC. Identified contaminated soils were excavated and stockpiled at the Site in accordance with our ADEC approved Corrective Action Plan. The stockpiled soils were then sampled using Multi Incremental Sampling techniques. This report details field site work and sample results.

## **2.0 PROJECT BACKGROUND**

### **2.1 Site Location and Description**

The Ungalik Airstrip (the Site) is located immediately north of the Ungalik River and lies 4 miles east of Norton Bay in Western Alaska. The Site is located within Sections 1 and 12, Township 11 South, Range 11 West, Kateel River Meridian at 64° 32'52.0" North, 160° 47' 30.6" West. The Site is on federal land administered by the US Bureau of Land Management (BLM). The nearest known inhabited area is Shaktoolik Alaska, 18.75 miles southwest of the site. There are no roads leading to or from the site.



A small mining camp with an airstrip along the north bank of the Ungalik River is located about one mile due east of the Site, and was used as the base of operations for the 2012 Corrective Action work.

## 2.2 Previous Investigations

On August 16 and 17, 2007 Ecology and Environment, Inc (E&E) completed a limited Site Characterization Assessment of the Ungalik Airstrip Drum Spill Site. During this time E&E collected a total of 23 surface and subsurface soil samples for field screening and laboratory analysis of Diesel Range Organics (DRO), Residual Range Organics (RRO), Gasoline Range Organics (GRO) and Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX). The objective of this sampling was to identify and characterize areas of contamination caused by the stored leaking drums. Laboratory analysis of the samples showed results as high as 59,400 mg/kg for DRO.

E&E identified three drum storage areas where diesel contamination is present. Those areas are identified as Drum Area 1 (DA1), 2 (DA2) and 3 (DA3). E&E also identified an area of contamination west of Drum Area 2 identified as the Dead Vegetation Area (DVA). These four areas are estimated to contain 50-100 cubic yards of diesel contaminated material.

In 2008, MACTEC used Geoprobe equipment in an attempt to delineate the diesel contaminated areas at the site, determine if groundwater is present at the site, and to develop a target cleanup level for the site based on the State of Alaska Department of Environmental Conservation (ADEC) regulations. MACTEC found that no groundwater is present at the Ungalik Airport site. MACTEC proposed a cleanup level of 10,250 mg/kg DRO, based on the Method Two Cleanup levels for the Ingestion pathway in the Under 40 inch Zone. This cleanup level has been approved by ADEC for the Site.

## 2.3 Project Objectives and Scope of Work

**NORTECH** and the BLM are working together to assess and remediate the contaminated soils from the Drum Storage areas and the Dead Vegetation area identified at the Ungalik Airstrip Drum Spill Site. **NORTECH** directed the excavation sub-contractor, Lakloey Inc, in the removal of diesel contaminated materials from the four areas identified during previous site investigations by E&E and MACTEC. Removed materials were placed into a treatment cell at the Site, in accordance with the approved Corrective Action Plan, attached as Appendix F.

**NORTECH** collected baseline samples of the former airstrip using multi-incremental sampling techniques, following the ADEC draft Guidance on Multi Increment Soil Sampling. This sampled area was later used as the land spread area. Excavation of



contaminated soils was performed from the DVA, DA1, DA2, and DA3 areas, using an excavator rented from the neighboring mining claim. **NORTECH** conducted field screening and soil sampling concurrent with this effort to ensure that all contaminated soils above 10,250 mg/kg are removed.

Excavations were backfilled with clean backfill, and graded to drain and prevent pooling and unsafe conditions. Fill material was obtained from the berms on the old airstrip or other nearby sources on BLM lands. **NORTECH** personnel were onsite during all field efforts.

The project was conducted in general accordance with the ADEC Draft Guidance on Multi Increment Soil Sampling (March 2009). Laboratory soil sample collection was conducted in general accordance with the ADEC Draft Field Sampling Guidance (FSG) Document (May 2010). Both guidance documents discuss methods on conducting site characterizations and cleanups.

**NORTECH** provided Qualified Persons, as defined in 18AAC75 to conduct field screening and laboratory sampling during the project. **NORTECH's** excavation subcontractor, Lakloey Inc, provided trained personnel to operate the heavy equipment used for the site work.

### 3.0 METHODOLOGY

#### 3.1 Field Screening Using the Photo-ionization Detector

**NORTECH** used the photo-ionization detector (PID) for field screening in the following manner:

Headspace screening consisted of partially (33%-50%) filling a clean re-sealable bag with freshly uncovered soils. The total capacity of the bag will not be less than 8 ounces (app. 350 ml). We used quart sized re-sealable bags for field screening samples at this Site.

The re-sealable bag was closed and headspace vapors were allowed to develop for at least 10 minutes and not more than one hour. The bag will be agitated at the beginning and end of the headspace development period. We generally aimed to test the soil headspace vapors at a temperature of at least 60° F (5° C). Soil samples were either warmed in the field using hand-warmers, or by heating them in one of the mine camp cabins. A small opening was made in the top of the bag and the PID probe inserted into the bag. Headspace vapors were drawn from the center of the space above the soils and analyzed by the PID for total volatile organic compounds. The highest PID readings from each sample were recorded in the project field notes for inclusion in the final report.



Calibration was performed in accordance with the manufacturer's specifications. In the event that background air contamination is encountered, it will be zeroed out by performing the calibration in an alternate location without contamination, or by utilizing uncontaminated calibration air. No background contamination was noted during this project. The calibration of the PID was checked at the beginning and end of each day and at least every four hours during continuous use. No calibration problems with the PID were noted during this project.

### 3.2 Field Soil Sample Collection

Site field work was performed during September 18 through September 21, 2012. Weather during field work varied, but in general was about 30 °F to 40°F with wind, snow, and rain. **NORTECH** personnel J. Ginter participated in field activities.

**NORTECH** implemented random systematic MI sampling for soil sample collection from the area underlying the land-spread material. This method was used to determine the concentration of background contamination (if any) prior to the construction of an unlined land-spreading area. **NORTECH** also used random systematic MI sampling to identify the contaminant levels within the land-spread material.

After the DU boundaries (roughly 50 cubic yards) within the land-spread area was identified and marked, each DU was broken down into a grid with about thirty individual sections. Each section was then broken into quadrants. **NORTECH** used a deck of cards and a die, to randomly determine the quadrant and the depth of soil sample collection.

The three excavation areas were sampled in accordance with ADEC Field Sampling Guidance. The three excavation areas correlated with the previously identified Drum Areas 1, 2, and 3 and are referred to in this report as DA1, DA2 and DA3. The area referred to as DVA, or Dead Vegetation Area, was part of the same excavation area as DA2.

The soil samples were collected by advancing soil borings using clam shovels and/or split spoon augers. These tools were decontaminated prior to field work and between each sample. The soil samples were collected using disposable collection equipment such as Ziploc bags and nitrile gloves. A soil sample was collected from each of the 30-some grid sections within a DU. Later, these soil samples were composited with other samples from the same DU, as described in the following Section 3.3. Photographs depicting field activities, grid sections, and sample processing procedures are presented in Appendix B.

### 3.3 MI Sample Processing and Composition for Laboratory Analysis

**NORTECH** collected MI samples to establish background conditions for soils underlying the land-spread area, and to characterize the contaminants present within the land-spread materials. A grid pattern was established over the sampling area, with 30 individual grids located within each sampling area. Each individual grid was broken into four quadrants. Playing cards were used to determine from which quadrant in each grid a sample aliquot would be collected. A 100 gram aliquot was collected from each grid square, from the randomly selected quadrant.

After collection, the sample aliquots were run through a 1/4 inch mesh (6.35mm) metal screen to remove large rock pieces and twigs. Soil clumps were broken up using a hammer and trowel, and the material passed through a #10 mesh soil sieve. From each aliquot, 50 g of the sieved material was then placed into a clean plastic tub, and the material thoroughly homogenized using a trowel. A grid with 30 sections was then overlaid on the sieved, homogenized material. A plastic plunger was used to collect 30 five gram aliquots, one from each grid section. These aliquots were then homogenized in a dish and placed into sample jars. Three samples were collected using this method for each section, resulting in triplicate samples. Per ADEC regulations, triplicate samples must be collected from decision units with known or suspected contamination. Given that the material placed into the land spread was suspected to contain petroleum contaminants, all MI samples collected from the landspread area were collected in triplicate.

Processing the soil samples to a maximum particle size of 2 mm, allows for a Fundamental Error of 8%, proving sufficient sample mass was submitted to adequately address compositional heterogeneity. The goal is to have a FE less than 15%. The MI guidance states that the fundamental error is directly related to the particle size of the population and the sample mass analyzed at the laboratory (25 grams for AK102), as illustrated by the following equation:

$$FE = \sqrt{\frac{20(d^3)}{m}}$$

Where: 20 = sampling constant  
d = maximum particle size (centimeters)  
m = sample mass analyzed (grams)

$$FE = \sqrt{\frac{20(0.2^3)}{25}}, FE = \sqrt{\frac{20(0.008)}{25}}, FE = \sqrt{\frac{0.16}{25}}, FE = \sqrt{0.0064}, FE=0.08$$

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FE%=(0.08)\*100, therefore Fundamental Error here is calculated at 8%.

The processed and composited soil samples collected were analyzed by SGS Environmental Services (SGS) in Anchorage, AK. The following list includes the analysis methods used by SGS:

- DRO by AK102

Sampling and sample processing equipment that contacted environmental media was decontaminated both before initial use and between decision units, to avoid cross contamination. Samples were placed in the appropriate sampling container, sealed, and placed promptly on ice (usually frozen gel packs) in a cooler in the custody of **NORTECH** personnel for laboratory submission.

#### 4.0 FIELD ACTIVITIES

The initial plan was to arrive at the project Site on September 17, 2012. However, all ERA flights were grounded on the 17th and with no other flights available to Unalakleet, the decision was reached between **NORTECH** and the BLM to attempt the flight on the next day. The excavation contractors, Lakloey Inc, chartered a flight from Fairbanks to the project Site and arrived on the 17th as scheduled.

On September 18, 2012 the first attempt to fly from Anchorage to Unalakleet was turned around by bad weather in the Alaska Range. **NORTECH** and BLM personnel arrived in Unalakleet at 1830 on the 18th, with **NORTECH** personnel continuing on to the project location that night. During this time, Lakloey personnel moved an excavator from the mine camp located at the Ungalik River to the former airstrip. Once there, Lakloey personnel used chainsaws and brush cutters to clear the project work area. That evening, after **NORTECH** personnel arrived, we reviewed and discussed the project work plan and the project Health and Safety Plan. Lakloey personnel informed us that both moose and brown bear sign was obvious within the project work area. Lakloey site personnel took turns at armed bear guard, in accordance with the project HSP.

On September 19, **NORTECH** personnel Jason Ginter, and Lakloey personnel Russ Hardy, Jeff Accola, and Scott MacMillan used four wheelers to get to the former airstrip site. While Lakloey personnel continued to clear brush from the project work area, **NORTECH** identified the wooden stakes from the previous investigation, and using these stakes, located all of the former drum storage areas and the areas that required excavation in accordance with our approved work plan.

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Lakloey cleared surface vegetation from the area between DA2 and DA3 for the planned land-spreading site. After the surface vegetation had been cleared, **NORTECH** laid out a grid pattern on the planned land-spread area to collect background soil samples using MI sampling techniques. This first land-spread area was laid out in a 30' by 50' rectangle. A total of 30 soil aliquots were collected from the area, and combined as described in Section 3.3.

Lakloey personnel began excavation work at the area marked as DA3 in earlier reports. We were able to locate the DA3 area by locating wooden lathe still in place labeled 07UAD19SB. Excavation work began at the east end of this area and proceeded west. Excavated material was placed onto the land-spread area simply by turning the excavator. **NORTECH** guided the excavation of the material via field screening by PID. The DA3 excavation area was found to have contaminants deeper on the east end, tapering upward on the west end of the excavation area. The DA3 excavation area is shown on Figure 4, and in more detail in Figure 6.

We estimate that about 20 cubic yards of material were removed from this excavation area. The excavated material consisted of sandy gravel and shattered rock. Field screening and visual observations were consistent with weathered diesel. **NORTECH** collected a total of seven closure samples and one field duplicate sample for laboratory analysis from this excavation area.

On the afternoon of September 19, Lakloey continued excavation work after **NORTECH** had identified the area of DA2. Lakloey began by digging at the northern portion of the previously identified contaminated area, with **NORTECH** guiding the excavation work via field screening. We found the contaminated soils within the northern portion of DA2 to a depth of 2.5 feet below the ground surface, and to depths of 5.2 feet bgs on the southern portion of excavated area. This excavation area overlapped the area identified in previous reports as DVA, and previously identified contaminated soils from both the DVA area and DA2 were addressed with this excavation. The DVA/DA2 excavation area is shown on Figure 4, and in greater detail on Figure 6.

We estimate that about 50 cubic yards of contaminated material were removed from this excavation area, consisting of sandy gravels and shattered rock. Field screening and visual observations were consistent with weathered diesel contamination. **NORTECH** collected a total of 10 soil samples for laboratory analysis from this excavation area.

Lakloey also excavated the identified DA1 on September 19, beginning on the north end. Given the location of the contaminated soil stockpile, it was necessary to track the material from the excavation area to the land-spread area. As excavation continued, we realized that the current land-spread area would not be sufficient to contain all of the excavated material from the project. **NORTECH** staked out an additional area to use for land-spreading, adjacent the initial land-spread area. Lakloey cleared this area of

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vegetation, and **NORTECH** once again laid out a sampling grid and collected background samples using MI sampling techniques.

As the excavation at DA1 continued, we found that the contaminated soils lens extended fairly deep on the south portion of the excavation area, to depths of 8.6 feet. Contaminated material removed from this area consisted of sandy gravels near the surface, shattered rock below two feet deep, with some oversize material at depth. The deep contaminated area was inconsistent, as fuel contamination apparently followed preferential pathways through the shattered rock to reach this depth. The eastern portion of the excavation extended to a depth of 4.5 feet, while contaminated area along the western edge of DA1 was fairly shallow, and excavation here was to 2.2 feet deep. We collected a total of 13 closure samples and one field duplicate from this excavation area for laboratory analysis. The excavation area is shown on Figure 4, with more detail, including the sample locations, shown on Figure 5.

Field screening of the soils removed from DA1 showed the contamination to be consistent with weathered diesel. Contaminated material removed from this area was first piled, and later land-spread to cover the area as shown on Figure 4. We estimate that about 180 cubic yards of material was removed from this excavation area.

All of the contaminated soil excavation areas (DVA, DA1, DA2, and DA3) were left open overnight until BLM personnel gave permission to backfill. Lakloey backfilled the excavations on September 20th after receiving BLM approval using earthen berm material available at the site, and used the excavator to spread the contaminated material throughout the land-spread area to a uniform depth of roughly 12 to 18 inches thick to aid in biodegradation of the diesel contamination.

After the material had been spread by Lakloey, **NORTECH** laid out a grid pattern over the land-spread area on September 21st. Using this grid pattern, **NORTECH** collected 30 aliquots from each 50 cubic yards of material following MI sampling guidelines. These aliquots were then blended as described in Section 3.3 of this report, and the samples submitted in triplicate. A total of five sets of triplicate samples were submitted for laboratory analysis from the land-spread soils.

Once **NORTECH** had completed sampling the land-spread material, Lakloey applied 320 pounds of high-nitrogen, quick release fertilizer (22-10-10 ratio) to the land-spread soils to aid in bio-degradation of the identified contaminants. Overall, the contaminated land-spread material consisted of sandy gravels, and shattered rock. We found that the material at depths greater than two to three feet bgs mainly consisted of highly friable rock. We did not encounter groundwater during any of the excavation work. A small amount of water had accumulated in the deepest section of the DA1 excavation area overnight. No free product or oil sheen was present on this water, and no water

samples were collected. We suspect the water present in the excavation was due to overnight rain.

During the course of this field work, **NORTECH** was able to identify the contaminated soil areas by finding wooden lathe markers left in place from previous site investigations. To avoid any confusion, after verifying the locations of previous site work, we removed the old stakes. **NORTECH** does note that the contaminated soil sample locations listed in previous site reports are not consistent. In particular, there is a significant difference in the sample locations and contaminated soil areas noted in MACTEC's 2009 report (Figure 3) and in E&E's 2008 report (Figure 4). The main differences are noted in the locations of the DVA and DA2. Site photos from previous work place the DVA and DA2 areas more closely in line with E&E's Figure 4.

We installed 2" by 2" stakes at the site to identify the September 2012 work areas. These stakes locations are identified on Figure 4. Our main reference point for mapping the Site is identified as RP1. RP1 is located at 64°32.826'N, 160°47.681'W. Each of the three excavation areas has a 2" by 2" stake at the northwest corner, and each stake is marked with an identifier and date, such as DA1NW092012. This designation allows to locate the area (drum area 1), corner, and date the stake was installed. The contaminated soil land-spread area is outlined with 2" by 2" stakes that are marked with an SS designation and orange flagging. **NORTECH's** site mapping was completed using 200' cloth tape, right angle mirror, laser distance meter, and sextant.

After all site work was completed, we installed a wooden sign on the land-spread area which reads:

**CAUTION!**

Surface soils in this flagged area are contaminated with diesel fuel. Skin contact or ingestion may be hazardous. For additional information contact BLM at 907 267 1226 or **NORTECH** at 907 586 6813.

Lakloey personnel removed the excavator from the former airstrip on September 21st. BLM personnel that were unable to reach the site due to flight and weather restrictions overflew the project area on the 21st.

No health and safety issues occurred during the field site work for this project. While recent animal sign and activity was noted within the project area, no large or potentially dangerous animals were sighted during project work.

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## 5.0 RESULTS WITH DISCUSSION

**NORTECH** collected two types of samples during this field site work. Grab samples were collected from the limits of the excavation areas to verify clean closure. MI samples were collected from the land-spread area prior to placing contaminated soils within the area to establish background data, and MI samples were also collected from the land-spread contaminated material to verify contaminant levels. MI sampling was used to achieve a statistically accurate picture of the diesel fuel concentration within the removed soils. **NORTECH** collected a total of 30 grab samples for closure. We collected 60 soil sample aliquots from the land-spread area, submitting two sets of MI triplicate samples to establish background levels, and 150 sample aliquots were collected from the diesel contaminated land-spread area resulting in five sets of MI triplicate samples. Even though the contaminated soils land-spread area can be considered one Decision Unit, we collected additional samples for a more detailed analysis of the land-spread material, since site field screening showed that the material would likely meet the ADEC cleanup criteria established for the site. To meet ADEC regulations, triplicate samples were collected from all material that was considered likely to contain contaminants, therefore, all land-spread area samples were collected in triplicate. All samples were sent to SGS Laboratories in Anchorage for analysis of DRO by method AK102. Laboratory results are listed in the following tables, broken down by sampling area.

The associated SGS laboratory report is located in Appendix C. A laboratory data review checklist exercise has been prepared for these results and is included as Appendix D. This exercise revealed that the laboratory had internal quality control issues, these are detailed in the Laboratory Data Review Checklist. Poor surrogate recovery caused us to consider Sample DA3-CL04 invalid. Although other minor data quality issues are noted, all other results have been deemed valid for use through appropriate corrective actions and are considered representative of Site conditions.

Table 7 contains data quality review for all multi-increment samples. Multi-increment sampling techniques were used to characterize the ground surface prior to land-spreading the excavated diesel contaminated material, and to characterize the contaminated land-spread material. Although the land-spread area can be considered one DU, a MI sample was collected for every 50 cubic yards of material. All land-spread samples were run in triplicate per ADEC regulations regarding sampling of suspected contaminated material. With the exception of one outlier, SS03a: nondetect; the average contaminant concentration



Table 2: Laboratory Results for Background Samples

Sample ID	Sample depth bgs	DRO (mg/kg)	PID reading
BG-1a	0-12"	56.3	0.1
BG-1b	0-12"	54.5	0.1
BG-1c	0-12"	129	0.1
BG-2a	0-12"	117	0.1
BG-2b	0-12"	81.6	0.1
BG-2c	0-12"	123	0.1

Table Notes: Sample results in **boldface** exceed ADEC cleanup levels for this project.

\*denotes field duplicate samples

NA- indicates the sample was not submitted for the analysis listed

J – indicates the result is an estimation

ND – indicates that the analyte was not detected

Table 3: Laboratory Results for DA1 Closure Samples

Sample ID	Sample depth bgs	DRO (mg/kg)	PID reading
DA1-CL01	2.2'	1,990	44
DA1-CL02	4.6'	142	10
DA1-CL03	4.5'	ND	0.4
DA1-CL04	4.5'	1,960	18
DA1-CL05*	4.5'	171	6.1
DA1-CL06	2.2'	9,820	33
DA1-CL07	8.1'	6,780	26
DA1-CL08	8.2'	1,280	22
DA1-CL09	8.1'	676	31
DA1-CL10	7.8'	466	5.4
DA1-CL11	8.6'	1,870	46
DA1-CL12	4.8'	8,450	28
DA1-CL13	4.8'	546	14
DA1-CL14*	4.5'	196	6.1

Table Notes: Sample results in **boldface** exceed ADEC cleanup levels for this project.

\*denotes field duplicate samples

NA- indicates the sample was not submitted for the analysis listed

J – indicates the result is an estimation

ND – indicates that the analyte was not detected





**Table 4: Laboratory Results for DVA/DA2 Closure Samples**

Sample ID	Sample depth bgs	DRO (mg/kg)	PID reading
DA2-CL01	5.2'	2,180	46
DA2-CL02	5.1'	1,710	19
DA2-CL03	5.1'	2,540	14
DA2-CL04	5.5'	481	12
DA2-CL05	4.8'	1,040	16
DA2-CL06	2.5'	2,690	44
DA2-CL07	2.4'	2,860	17
DA2-CL08	2.9'	2,700	22
DA2-CL09	2.2'	103	0.1
DA2-CL10	2.6'	3,760	18

Table Notes: Sample results in **boldface** exceed ADEC cleanup levels for this project.

\*denotes field duplicate samples

NA- indicates the sample was not submitted for the analysis listed

J – indicates the result is an estimation

ND – indicates that the analyte was not detected

**Table 5: Laboratory Results for DA3 Closure Samples**

Sample ID	Sample depth bgs	DRO (mg/kg)	PID reading
DA3-CL01*	4.0'	6,090	44
DA3-CL02	3.7'	80.6	0.4
DA3-CL03	3.9'	ND	0.4
DA3-CL04**	4.0'	12,800	24
DA3-CL05	2.6'	336	18
DA3-CL06	3.0'	812	22
DA3-CL07	2.7'	570	18
DA3-CL08*	4.0'	5,630	44

Table Notes: Sample results in **boldface** exceed ADEC cleanup levels for this project.

\*denotes field duplicate samples

NA- indicates the sample was not submitted for the analysis listed

J – indicates the result is an estimation

ND – indicates that the analyte was not detected

**\*\*Sample DA3-CL04 has been deemed invalid, due to 0% surrogate recovery, as detailed in laboratory data review checklist.**





**Table 6: Laboratory Results for Land-Spread Contaminated Soil Samples**

<b>Sample ID</b>	<b>Sample depth bgs</b>	<b>DRO (mg/kg)</b>	<b>PID reading</b>
SS-01a	0-15"	3,000	26
SS-01b	0-15"	3,740	22
SS-01c	0-15"	3,950	31
SS-02a	0-15"	3,820	22
SS-02b	0-15"	3,220	18
SS-02c	0-15"	3,990	30
SS-03a	0-15"	ND	18
SS-03b	0-15"	3,870	14
SS-03c	0-15"	3,660	22
SS-04a	0-15"	4,100	24
SS-04b	0-15"	3,830	18
SS-04c	0-15"	4,150	18
SS-05a	0-15"	4,600	22
SS-05b	0-15"	2,820	18
SS-05c	0-15"	4,350	24

Table Notes: Sample results in **boldface** exceed ADEC cleanup levels for this project.

\*denotes field duplicate samples

NA- indicates the sample was not submitted for the analysis listed

J – indicates the result is an estimation

ND – indicates that the analyte was not detected





Table 7: MI Sample Data Quality Review

Sample ID	Result	Mean	95% UCL	SD	RSD (%)
BG-1A	56.3	79.93	151.6	42.5	<b>53.17153</b>
BG-1B	54.5				
BG-1C	129				
BG-2A	117	107.2	144.9	22.37	20.86754
BG-2B	81.6				
BG-2C	123				
SS-01A	3000	3563	4405	499	14.00505
SS-01B	3740				
SS-01C	3950				
SS-02A	3820	3677	4359	404.5	11.00082
SS-02B	3220				
SS-02C	3990				
SS-03A	7.9*	2513	6174	2172	<b>86.43056</b>
SS-03B	3870				
SS-03C	3660				
SS-04A	4100	4027	4317	172.1	4.273653
SS-04B	3830				
SS-04C	4150				
SS-05A	4600	3923	5548	963.7	24.56538
SS-05B	2820				
SS-05C	4350				

\* Sample ND (DL)

**Bold** – Does not meet DQO's



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## 6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the activities completed at the Site, **NORTECH** has developed the following conclusions:

- **NORTECH** has updated the Conceptual Site Model (CSM), included as Appendix E, to reflect the results of this 2012 site soils assessment.
- All three of the former drum storage areas excavated demonstrate that Site cleanup goals have been obtained at the limits of the excavations. The DVA was addressed during the excavation work at DA2.
- Lakloey excavated and land-spread about 250 cubic yards of diesel contaminated material during this Site work. 320 pounds of high nitrogen fertilizer were added to the land-spread area to aid in bioremediation.
- Background samples collected from the land-spread area prior to contaminated soils placement show that an average diesel concentration of 93.6 mg/kg was present prior to land-spreading of diesel contaminated soils on the area.
- Based on the MI sampling data collected after the excavated material had been land-spread, the land-spread material meets ADEC's Site cleanup goal, containing less than 10,250 mg/kg DRO. Soils within the land-spread area contain 2,820 to 4,600 mg/kg DRO. Based on the Site cleanup goals being met, we anticipate that no further investigation is necessary at the former Ungalik Airstrip Site.

## 7.0 LIMITATIONS AND NOTIFICATIONS

**NORTECH** provides a level of service that is performed within the standards of care and competence of the environmental engineering profession. However, it must be recognized that limitations exist within any site investigation. This report provides results based on a restricted work scope and from the analysis and observation of a limited number of samples. Therefore, while it is our opinion that these limitations are reasonable and adequate for the purposes of this report, actual site conditions may differ. Specifically, the unknown nature of exact subsurface physical conditions, sampling locations, the analytical procedures' inherent limitations, as well as financial and time constraints are limiting factors.

The report is a record of observations and measurements made on the subject site as described. The data should be considered representative only of the time the site investigation was completed. No other warranty or presentation, either expressed or implied, is included or intended. This report is prepared for the exclusive use of BLM. If it is made available to others, it should be for information on factual data only, and not as a warranty of conditions, such as those interpreted from the results presented or



---

discussed in the report. We certify that except as specifically noted in this report, all statements and data appearing in this report are in conformance with ADEC's Standard Sampling Procedures. **NORTECH** has performed the work, made the findings, and proposed the recommendations described in this report in accordance with generally accepted environmental engineering practices.

## 8.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

**Jason Ginter**, Juneau Technical Manager for **NORTECH**, has a B.S. in Chemistry and extensive experience conducting site remediation, hazardous materials investigations, property assessments, and other environmental fieldwork throughout Alaska.

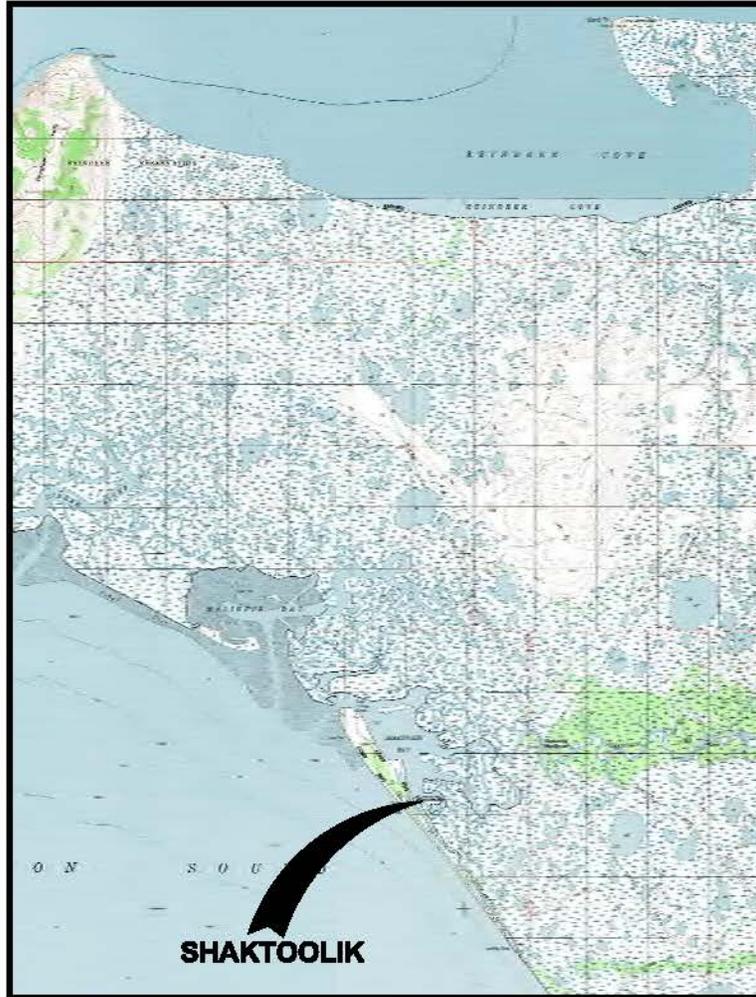
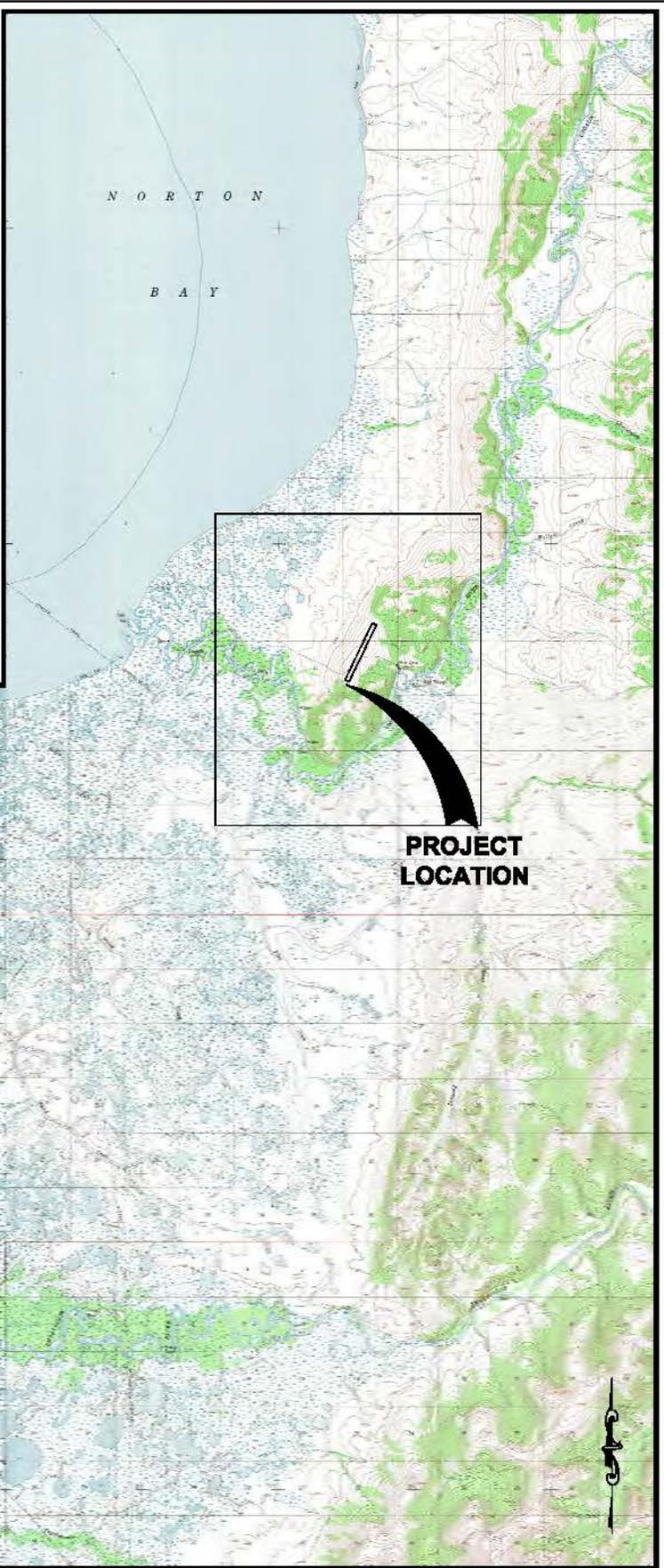
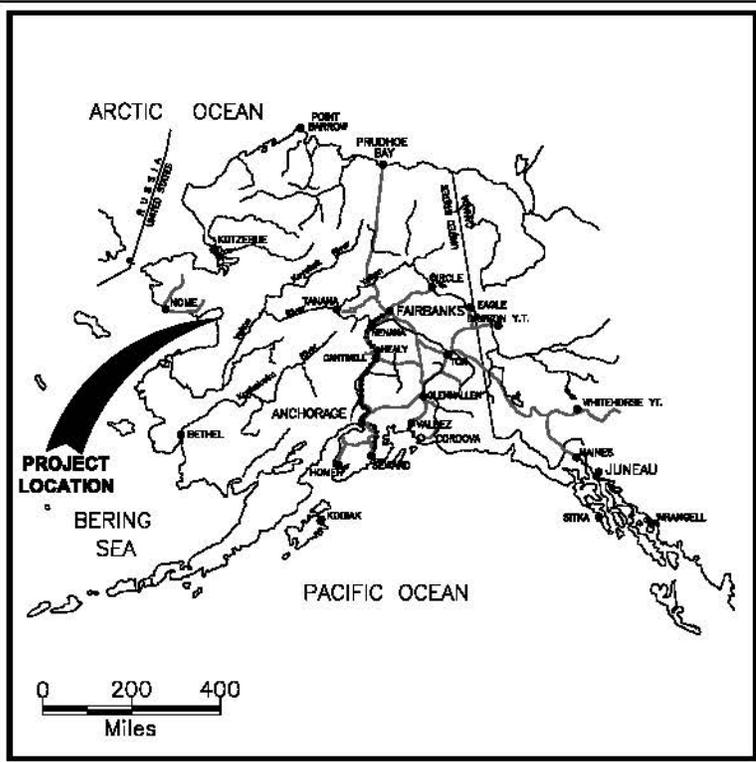
A handwritten signature in black ink, appearing to read "Jason Ginter".

Principal, Juneau Technical Manager



# Appendix A

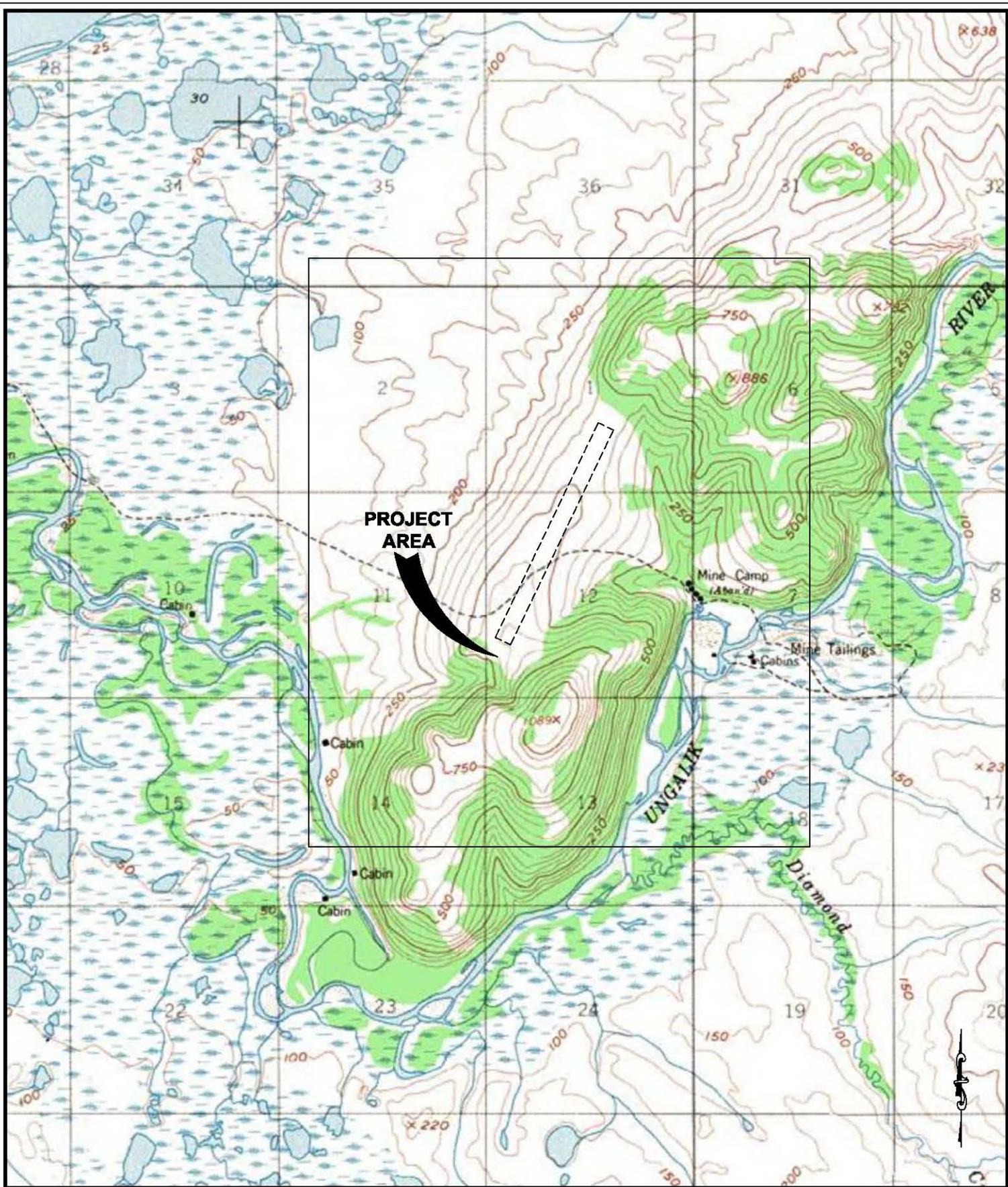
## Figures



ENVIRONMENTAL ENGINEERING HEALTH & SAFETY  
 2400 College Road, Fairbanks, Alaska 99709 Ph: 907-452-5888  
 3105 Lakeshore Dr., Anchorage, Alaska 99517, Ph: 907-222-2445  
 5438 Shaune Dr., Juneau, Alaska 99801 Ph: 907-586-6813

Location Map  
 Ungalik Airstrip  
 Ungalik, Alaska

SCALE: 1"=5miles	FIGURE: 1
DESIGN: JG	
DRAWN: CMR	
PROJECT NO: 12-2101	
DWG: 122101a(01)	
DATE: 3/26/2013	



ENVIRONMENTAL ENGINEERING HEALTH & SAFETY  
 2400 College Road, Fairbanks, Alaska 99709 Ph: 907-452-5688  
 3105 Lakeshore Dr., Anchorage, Alaska 99517, Ph: 907-222-2445  
 5438 Shaune Dr., Juneau, Alaska 99801 Ph: 907-586-6813

Vicinity Map  
 Ungalik Airstrip  
 Ungalik, Alaska

SCALE: 1"=1 mile	FIGURE:
DESIGN: JG	2
DRAWN: CMR	
PROJECT NO: 12-2101	
DWG: 122101(02)	
DATE: 3/26/2013	



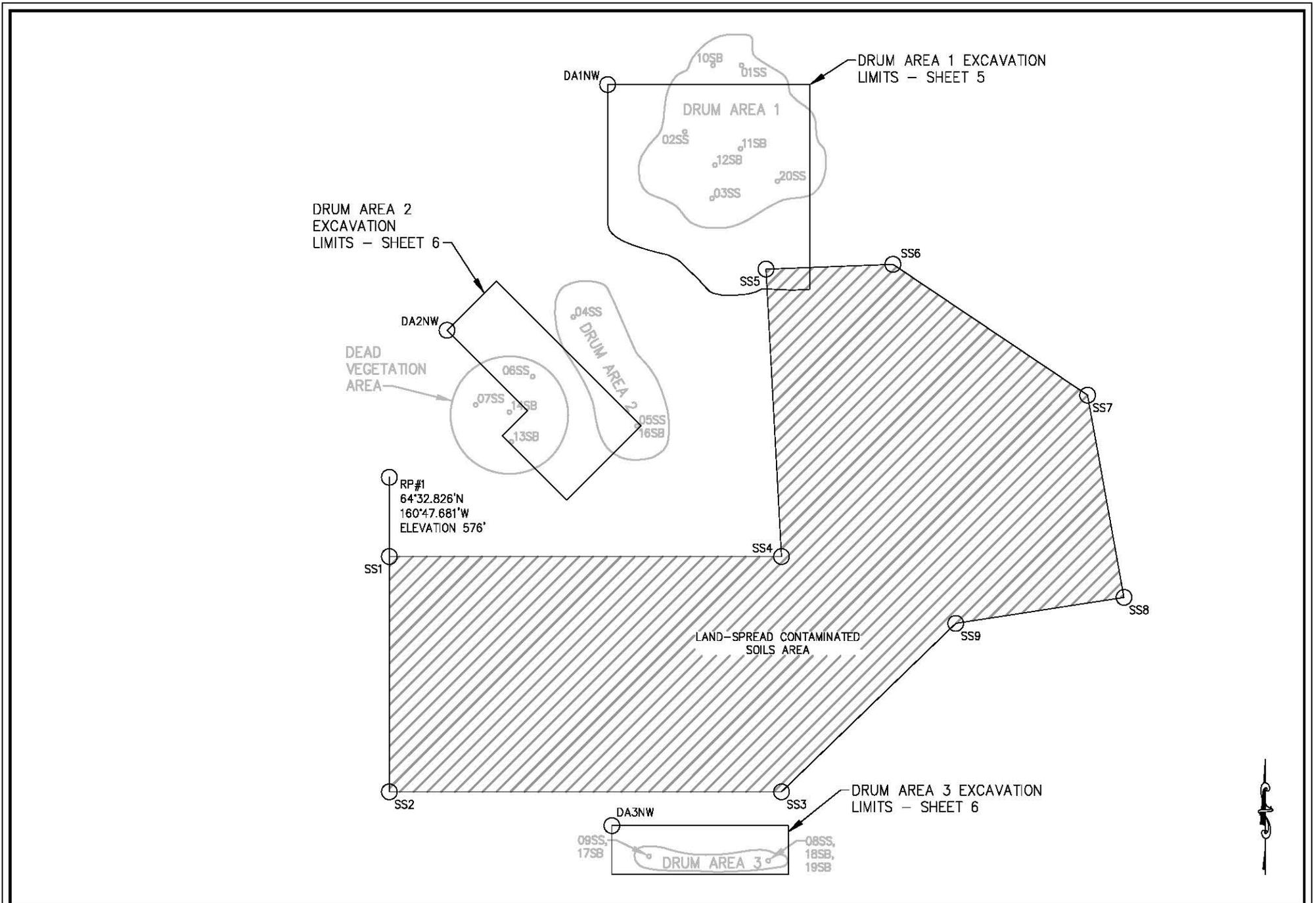
PROJECT  
AREA



ENVIRONMENTAL ENGINEERING HEALTH & SAFETY  
2400 College Road, Fairbanks, Alaska 99709 Ph: 907-452-5688  
3105 Lakeshore Dr., Anchorage, Alaska 99517, Ph: 907-222-2445  
5438 Shaune Dr., Juneau, Alaska 99801 Ph: 907-586-6813

Vicinity Map  
Ungalik Airstrip  
Ungalik, Alaska

SCALE: 1"=1/2mile	FIGURE:
DESIGN: JG	3
DRAWN: CMR	
PROJECT NO: 12-2101	
DWG: 122101(03)	
DATE: 3/26/2013	

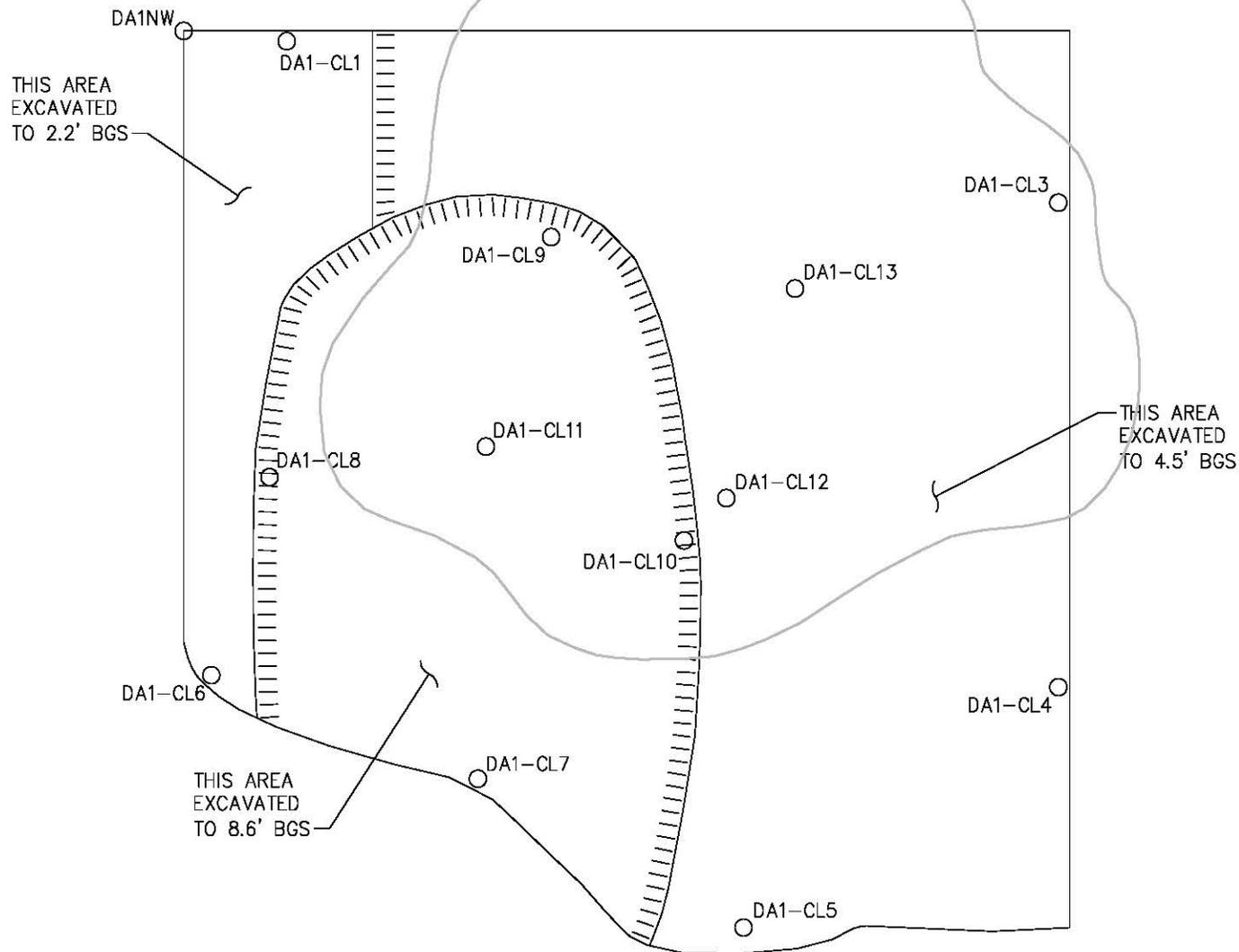


ENVIRONMENT, ENERGY, HEALTH & SAFETY CONSULTANTS  
 2400 College Road, Fairbanks, AK. 99709, 907-452-5888  
 3105 Lakeshore Dr., Anchorage, AK. 99517 907-222-2445  
 5438 Shaune Dr., Juneau, Alaska 99801 907-586-6813

Area Map  
 Ungalik Airstrip  
 Ungalik, Alaska

DATE: 3/26/2013	SCALE: 1" = 16'
DESIGN: JG	PROJECT: 12-2101
DRAWN: CMR	DWG: 122101a(04)

FIGURE  
 4

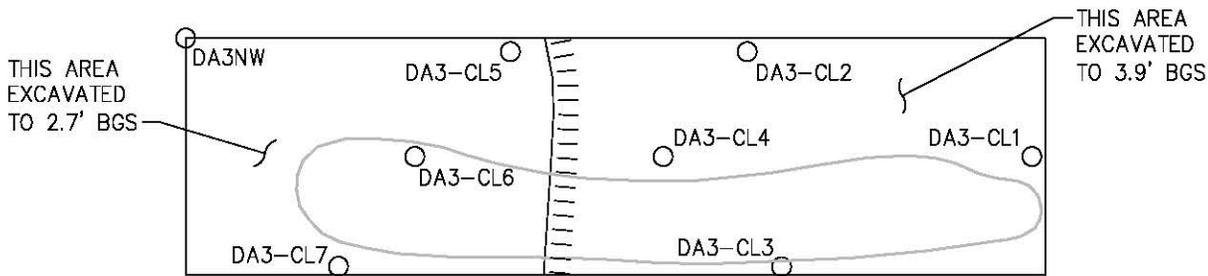
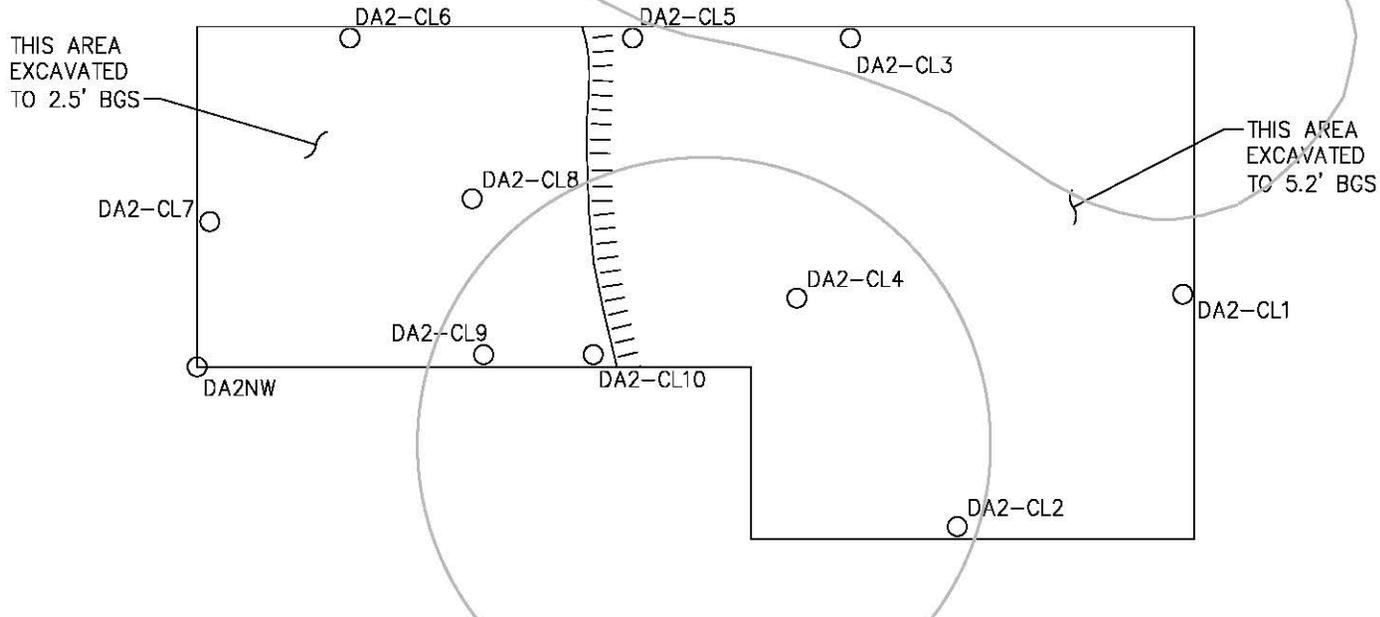


ENVIRONMENT, ENERGY, HEALTH & SAFETY CONSULTANTS  
 2400 College Road, Fairbanks, AK. 99709, 907-452-5888  
 3105 Lakeshore Dr., Anchorage, AK. 99517 907-222-2445  
 5438 Shaune Dr., Juneau, Alaska 99801 907-586-6813

Drum Area 1 Excavation Limits  
 Ungalik Airstrip  
 Ungalik, Alaska

DATE: 3/26/2013	SCALE: 1" = 5'
DESIGN: JG	PROJECT: 12-2101
DRAWN: CMR	DWG: 122101a(05)

FIGURE  
5



ENVIRONMENT, ENERGY, HEALTH & SAFETY CONSULTANTS  
 2400 College Road, Fairbanks, AK. 99709, 907-452-5888  
 3105 Lakeshore Dr., Anchorage, AK. 99517 907-222-2445  
 5438 Shaune Dr., Juneau, Alaska 99801 907-586-6813

Drum Area 2 and 3 Excavation Limits  
 Ungalik Airstrip  
 Ungalik, Alaska

DATE: 3/26/2013	SCALE: 1" = 16'
DESIGN: JG	PROJECT: 12-2101
DRAWN: CMR	DWG: 122101a(06)

FIGURE  
 6

Appendix B  
Site Photographs



**Photo 1:** Photo showing subject area of Ungalik Airstrip



**Photo 2:** Initial background sampling grid in land-spread area.



**Photo 3:** DA3 excavation area.



**Photo 4:** DA3 excavation area.



**Photo 5:** *DVA/DA2 excavation area.*



**Photo 6:** *DVA/DA2 excavation area, note surface scraping beyond excavation area*



**Photo 7:** *Friable rock in DA1 excavation area*



**Photo 8:** *DA1 excavation area, note friable rock layer*



**Photo 9:** SW corner of DVA/DA2 excavation area



**Photo 10:** Example of marker stakes left after September 2012 field work



**Photo 11:** *MI sampling aliquot locations, land-spread area*



**Photo 12:** *MI sampling aliquot locations, land-spread area*



*Photo 13: Fertilizer applied to land-spread soils*



*Photo 14: Applying fertilizer to land-spread soils area*

Appendix C  
SGS Laboratory Report



**SGS North America Inc.**  
**Alaska Division**  
**Level II Laboratory Data Report**

Project: Ungalik Airstrip  
Client: Nortech  
SGS Work Order: 1128514

Released by:

**Contents (Bookmarked in PDF):**

Cover Page  
Case Narrative  
Sample Results Forms  
Quality Control Summary Forms  
Chain of Custody/Sample Receipt Forms  
Attachments (if applicable)



Case Narrative

Client NORTECH Nortech  
Workorder 1128514 Ungalik Airstrip

Printed Date/Time 10/10/2012 10:25

Sample ID Client Sample ID

---

Refer to the sample receipt form for information on sample condition.

---

- 1128514001 PS DA3-CL01**  
AK102 - The pattern is consistent with a weathered middle distillate.  
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
- 1128514002 PS DA3-CL02**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514004 PS DA3-CL04**  
AK102 - The pattern is consistent with a weathered middle distillate.  
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
- 1128514005 PS DA3-CL05**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514006 PS DA3-CL06**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514007 PS DA3-CL07**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514008 PS DA3-CL08**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514009 PS BG-1A**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514010 PS BG-1B**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514011 PS BG-1C**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514012 PS BG-2A**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514013 PS BG-2B**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514014 PS BG-2C**  
AK102 - The pattern is consistent with a weathered middle distillate.
- 1128514015 PS SS-05A**  
AK102 - The pattern is consistent with a weathered middle distillate.



Case Narrative

Client NORTECH Nortech  
Workorder 1128514 Ungalik Airstrip

Printed Date/Time 10/10/2012 10:25

Sample ID		Client Sample ID
1128514016	PS	SS-05B
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514017	PS	SS-05C
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514018	PS	SS-04A
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514019	PS	SS-04B
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514020	PS	SS-04C
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514022	PS	SS-03B
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514023	PS	SS-03C
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514024	PS	SS-02A
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514025	PS	SS-02B
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514026	PS	SS-02C
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514027	PS	SS-01A
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514028	PS	SS-01B
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514029	PS	SS-01C
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514030	PS	DA1-CL01
AK102 - The pattern is consistent with a weathered middle distillate.		
1128514031	PS	DA1-CL02
AK102 - The pattern is consistent with a weathered middle distillate.		

\* QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.



## Case Narrative

**Client** NORTECH Nortech  
**Workorder** 1128514 Ungalik Airstrip

**Printed Date/Time** 10/10/2012 10:25

**Sample ID** **Client Sample ID**

---

**1128514033 PS DA1-CL04**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514034 PS DA1-CL05**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514035 PS DA1-CL06**

AK102 - The pattern is consistent with a weathered middle distillate.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

**1128514036 PS DA1-CL07**

AK102 - The pattern is consistent with a weathered middle distillate.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

**1128514037 PS DA1-CL08**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514038 PS DA1-CL09**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514039 PS DA1-CL10**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514040 PS DA1-CL11**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514041 PS DA1-CL12**

AK102 - The pattern is consistent with a weathered middle distillate.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

**1128514042 PS DA1-CL13**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514043 PS DA1-CL14**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514044 PS DA2-CL01**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514045 PS DA2-CL02**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514046 PS DA2-CL03**

AK102 - The pattern is consistent with a weathered middle distillate.

**1128514047 PS DA2-CL04**



Case Narrative

Client NORTECH Nortech  
Workorder 1128514 Ungalik Airstrip

Printed Date/Time 10/10/2012 10:25

Sample ID		Client Sample ID
	AK102 - The pattern is consistent with a weathered middle distillate.	
1128514048	PS	DA2-CL05
	AK102 - The pattern is consistent with a weathered middle distillate.	
1128514049	PS	DA2-CL06
	AK102 - The pattern is consistent with a weathered middle distillate.	
1128514050	PS	DA2-CL07
	AK102 - The pattern is consistent with a weathered middle distillate.	
1128514051	PS	DA2-CL08
	AK102 - The pattern is consistent with a weathered middle distillate.	
1128514052	PS	DA2-CL09
	AK102 - The pattern is consistent with a weathered middle distillate.	
1128514053	PS	DA2-CL10
	AK102 - The pattern is consistent with a weathered middle distillate.	
1119348	* MB	MB for HBN 1382068 [XXX/28150]
	AK103 - MB result is greater than one-half the LOQ, however less than the LOQ.	

Jason Ginter  
Nortech  
5438 Shaune Dr, #B  
Juneau, AK 99801

---

**Work Order:** 1128514  
Ungalik Airstrip  
**Client:** Nortech  
**Report Date:** October 10, 2012

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Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions ([http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm)), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO 17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities. The following descriptors or qualifiers may be found in your report:

- \* The analyte has exceeded allowable regulatory or control limits.
- ! Surrogate out of control limits.
- B Indicates the analyte is found in a blank associated with the sample.
- CCV Continuing Calibration Verification
- CL Control Limit
- D The analyte concentration is the result of a dilution.
- DF Dilution Factor
- DL Detection Limit (i.e., maximum method detection limit)
- E The analyte result is above the calibrated range.
- F Indicates value that is greater than or equal to the DL
- GT Greater Than
- ICV Initial Calibration Verification
- J The quantitation is an estimation.
- JL The analyte was positively identified, but the quantitation is a low estimation.
- LCS(D) Laboratory Control Spike (Duplicate)
- LOD Limit of Detection (i.e., 2xDL)
- LOQ Limit of Quantitation (i.e., reporting or practical quantitation limit)
- LT Less Than
- M A matrix effect was present.
- MB Method Blank
- MS(D) Matrix Spike (Duplicate)
- ND Indicates the analyte is not detected.
- Q QC parameter out of acceptance range.
- R Rejected
- RPD Relative Percent Difference
- U Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.  
All DRO/RRO analyses are integrated per SOP.



## Detectable Results Summary

Print Date: 10/10/2012 10:25 am

Client Sample ID: **DA3-CL01**

SGS Ref. #: 1128514001

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6090	mg/Kg

Client Sample ID: **DA3-CL02**

SGS Ref. #: 1128514002

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	80.6	mg/Kg

Client Sample ID: **DA3-CL04**

SGS Ref. #: 1128514004

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	12800	mg/Kg

Client Sample ID: **DA3-CL05**

SGS Ref. #: 1128514005

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	336	mg/Kg

Client Sample ID: **DA3-CL06**

SGS Ref. #: 1128514006

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	812	mg/Kg

Client Sample ID: **DA3-CL07**

SGS Ref. #: 1128514007

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	570	mg/Kg

Client Sample ID: **DA3-CL08**

SGS Ref. #: 1128514008

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	5630	mg/Kg

Client Sample ID: **BG-1A**

SGS Ref. #: 1128514009

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	56.3	mg/Kg

Client Sample ID: **BG-1B**

SGS Ref. #: 1128514010

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	54.5	mg/Kg



## Detectable Results Summary

Print Date: 10/10/2012 10:25 am

Client Sample ID: **BG-1C**

SGS Ref. #: 1128514011

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	129	mg/Kg

Client Sample ID: **BG-2A**

SGS Ref. #: 1128514012

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	117	mg/Kg

Client Sample ID: **BG-2B**

SGS Ref. #: 1128514013

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	81.6	mg/Kg

Client Sample ID: **BG-2C**

SGS Ref. #: 1128514014

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	123	mg/Kg

Client Sample ID: **SS-05A**

SGS Ref. #: 1128514015

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	4600	mg/Kg

Client Sample ID: **SS-05B**

SGS Ref. #: 1128514016

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2820	mg/Kg

Client Sample ID: **SS-05C**

SGS Ref. #: 1128514017

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	4350	mg/Kg

Client Sample ID: **SS-04A**

SGS Ref. #: 1128514018

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	4100	mg/Kg

Client Sample ID: **SS-04B**

SGS Ref. #: 1128514019

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3830	mg/Kg



## Detectable Results Summary

Print Date: 10/10/2012 10:25 am

Client Sample ID: **SS-04C**

SGS Ref. #: 1128514020

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	4150	mg/Kg

Client Sample ID: **SS-03B**

SGS Ref. #: 1128514022

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3870	mg/Kg

Client Sample ID: **SS-03C**

SGS Ref. #: 1128514023

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3660	mg/Kg

Client Sample ID: **SS-02A**

SGS Ref. #: 1128514024

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3820	mg/Kg

Client Sample ID: **SS-02B**

SGS Ref. #: 1128514025

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3220	mg/Kg

Client Sample ID: **SS-02C**

SGS Ref. #: 1128514026

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3990	mg/Kg

Client Sample ID: **SS-01A**

SGS Ref. #: 1128514027

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3000	mg/Kg

Client Sample ID: **SS-01B**

SGS Ref. #: 1128514028

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3740	mg/Kg

Client Sample ID: **SS-01C**

SGS Ref. #: 1128514029

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3950	mg/Kg



## Detectable Results Summary

Print Date: 10/10/2012 10:25 am

Client Sample ID: **DA1-CL01**

SGS Ref. #: 1128514030

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1990	mg/Kg

Client Sample ID: **DA1-CL02**

SGS Ref. #: 1128514031

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	142	mg/Kg

Client Sample ID: **DA1-CL04**

SGS Ref. #: 1128514033

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1960	mg/Kg

Client Sample ID: **DA1-CL05**

SGS Ref. #: 1128514034

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	171	mg/Kg

Client Sample ID: **DA1-CL06**

SGS Ref. #: 1128514035

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	9820	mg/Kg

Client Sample ID: **DA1-CL07**

SGS Ref. #: 1128514036

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6780	mg/Kg

Client Sample ID: **DA1-CL08**

SGS Ref. #: 1128514037

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1280	mg/Kg

Client Sample ID: **DA1-CL09**

SGS Ref. #: 1128514038

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	676	mg/Kg

Client Sample ID: **DA1-CL10**

SGS Ref. #: 1128514039

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	466	mg/Kg



## Detectable Results Summary

Print Date: 10/10/2012 10:25 am

Client Sample ID: **DA1-CL11**

SGS Ref. #: 1128514040

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1870	mg/Kg

Client Sample ID: **DA1-CL12**

SGS Ref. #: 1128514041

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8450	mg/Kg

Client Sample ID: **DA1-CL13**

SGS Ref. #: 1128514042

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	546	mg/Kg

Client Sample ID: **DA1-CL14**

SGS Ref. #: 1128514043

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	196	mg/Kg

Client Sample ID: **DA2-CL01**

SGS Ref. #: 1128514044

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2180	mg/Kg

Client Sample ID: **DA2-CL02**

SGS Ref. #: 1128514045

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1710	mg/Kg

Client Sample ID: **DA2-CL03**

SGS Ref. #: 1128514046

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2540	mg/Kg

Client Sample ID: **DA2-CL04**

SGS Ref. #: 1128514047

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	481	mg/Kg

Client Sample ID: **DA2-CL05**

SGS Ref. #: 1128514048

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1040	mg/Kg



## Detectable Results Summary

Print Date: 10/10/2012 10:25 am

Client Sample ID: **DA2-CL06**

SGS Ref. #: 1128514049

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2690	mg/Kg

Client Sample ID: **DA2-CL07**

SGS Ref. #: 1128514050

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2860	mg/Kg

Client Sample ID: **DA2-CL08**

SGS Ref. #: 1128514051

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2700	mg/Kg

Client Sample ID: **DA2-CL09**

SGS Ref. #: 1128514052

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	103	mg/Kg

Client Sample ID: **DA2-CL10**

SGS Ref. #: 1128514053

### Semivolatile Organic Fuels Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	3760	mg/Kg



SGS Ref.# 1128514001  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA3-CL01  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 11:10  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.  
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	6090	469	mg/Kg	AK102	A		09/29/12	10/02/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	0	!	%	AK102	A	50-150	09/29/12	10/02/12	MEM
<b><u>Solids</u></b>									
Total Solids	84.7		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514002  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA3-CL02  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 11:14  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	80.6	22.7	mg/Kg	AK102	A		09/29/12	10/02/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	93.6		%	AK102	A	50-150	09/29/12	10/02/12	MEM
<b><u>Solids</u></b>									
Total Solids	87.5		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514003  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA3-CL03  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 11:17  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	22.8	mg/Kg	AK102	A		09/29/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	77.3		%	AK102	A	50-150	09/29/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	86.9		%	SM21 2540G	A			09/28/12	CNP



**SGS Ref.#** 1128514004  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA3-CL04  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 11:19  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.  
 AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	12800	1290	mg/Kg	AK102	A		09/29/12	10/02/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	0	!	%	AK102	A	50-150	09/29/12	10/02/12	MEM
<b><u>Solids</u></b>									
Total Solids	76.9		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514005  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA3-CL05  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 11:22  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	336	22.2	mg/Kg	AK102	A		09/29/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	85.6		%	AK102	A	50-150	09/29/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	89.8		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514006  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA3-CL06  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 11:24  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	812	30.7	mg/Kg	AK102	A		09/29/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	80.5		%	AK102	A	50-150	09/29/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	64.7		%	SM21 2540G	A			09/28/12	CNP



**SGS Ref.#** 1128514007  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA3-CL07  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 11:27  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	570	24.5	mg/Kg	AK102	A		09/29/12	10/02/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	79.9		%	AK102	A	50-150	09/29/12	10/02/12	MEM
<b><u>Solids</u></b>									
Total Solids	81.3		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514008  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA3-CL08  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 11:28  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	5630	274	mg/Kg	AK102	A		09/29/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	99.5		%	AK102	A	50-150	09/29/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	72.9		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514009  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID BG-1A  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 10:00  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	56.3	25.6	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	74.9		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	77.5		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514010  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID BG-1B  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 10:00  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	54.5	25.7	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	78.1		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	77.8		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514011  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID BG-1C  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 10:00  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	129	25.7	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	79.5		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	77.4		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514012  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID BG-2A  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 14:30  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	117	25.3	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	71.6		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	78.5		%	SM21 2540G	A			09/28/12	CNP



**SGS Ref.#** 1128514013  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** BG-2B  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 14:30  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	81.6	25.8	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	65		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	77.5		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514014  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID BG-2C  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 14:30  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	123	27.5	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	73.1		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	72.5		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514015  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-05A  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 13:30  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	4600	248	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	109		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	80.4		%	SM21 2540G	A			09/28/12	CNP



**SGS Ref.#** 1128514016  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** SS-05B  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/21/2012 13:30  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	2820	252	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	97.6		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	78.6		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514017  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-05C  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 13:30  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	4350	255	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	118		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	77.5		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514018  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-04A  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 13:12  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	4100	255	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	104		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	77.5		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514019  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-04B  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 13:12  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3830	257	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	110		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	77.7		%	SM21 2540G	A			09/28/12	CNP



**SGS Ref.#** 1128514020  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** SS-04C  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/21/2012 13:12  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	4150	253	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	106		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	78.3		%	SM21 2540G	A			09/28/12	CNP



SGS Ref.# 1128514021  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-03A  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:55  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	25.5	mg/Kg	AK102	A		10/02/12	10/04/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	86.6		%	AK102	A	50-150	10/02/12	10/04/12	MEM
<b><u>Solids</u></b>									
Total Solids	78.2		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514022  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-03B  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:55  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3870	255	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	98.9		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	78.1		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514023  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-03C  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:55  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3660	256	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	87.8		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	77.1		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514024  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-02A  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:44  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3820	260	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	95.1		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	76.5		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514025  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-02B  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:44  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3220	253	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	79.9		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	78.1		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514026  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-02C  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:44  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3990	244	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	113		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	81.9		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514027  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-01A  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:30  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3000	257	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	96.1		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	77.3		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514028  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-01B  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:30  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3740	258	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <sur>	97.6		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	77.4		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514029  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID SS-01C  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/21/2012 12:30  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3950	259	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	108		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	76.7		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514030  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL01  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:05  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	1990	137	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	98.8		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	72.9		%	SM21 2540G	A			10/01/12	CNP



**SGS Ref.#** 1128514031  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA1-CL02  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 17:07  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	142	24.8	mg/Kg	AK102	A		10/02/12	10/04/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	89.2		%	AK102	A	50-150	10/02/12	10/04/12	MEM
<b><u>Solids</u></b>									
Total Solids	79.5		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514032  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL03  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:10  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	ND	23.4	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	76		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	85.2		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514033  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL04  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:14  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	1960	109	mg/Kg	AK102	A		10/01/12	10/03/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	105		%	AK102	A	50-150	10/01/12	10/03/12	MEM
<b><u>Solids</u></b>									
Total Solids	91.8		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514034  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL05  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:17  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	171	23.5	mg/Kg	AK102	A		10/01/12	10/01/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	78.7		%	AK102	A	50-150	10/01/12	10/01/12	MEM
<b><u>Solids</u></b>									
Total Solids	83.7		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514035  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL06  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:19  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.  
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	9820	447	mg/Kg	AK102	A		10/01/12	10/02/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	0	!	%	AK102	A	50-150	10/01/12	10/02/12	MEM
<b><u>Solids</u></b>									
Total Solids	89.4		%	SM21 2540G	A			09/29/12	CNP



**SGS Ref.#** 1128514036  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA1-CL07  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 17:23  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.  
 AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	6780	437	mg/Kg	AK102	A		10/03/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	0	!	%	AK102	A	50-150	10/03/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	91.5		%	SM21 2540G	A			09/29/12	CNP



**SGS Ref.#** 1128514037  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA1-CL08  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 17:26  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	1280	85.3	mg/Kg	AK102	A		10/02/12	10/04/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	89.9		%	AK102	A	50-150	10/02/12	10/04/12	MEM
<b><u>Solids</u></b>									
Total Solids	93.7		%	SM21 2540G	A			09/29/12	CNP



**SGS Ref.#** 1128514038  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA1-CL09  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 17:30  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	676	21.8	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	101		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	91.4		%	SM21 2540G	A			09/29/12	CNP



**SGS Ref.#** 1128514039  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA1-CL10  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 17:34  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	466	21.4	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	99.5		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	92.0		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514040  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL11  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:37  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	1870	94.1	mg/Kg	AK102	A		10/03/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	93.9		%	AK102	A	50-150	10/03/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	83.7		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514041  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL12  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:41  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.  
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	8450	1110	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	0	!	%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	89.3		%	SM21 2540G	A			10/01/12	CNP



SGS Ref.# 1128514042  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL13  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:45  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	546	22.8	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	93.2		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	87.0		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514043  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA1-CL14  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 17:50  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	196	23.9	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	82.2		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	83.6		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514044  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL01  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 13:44  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	2180	118	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	72.4		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	67.6		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514045  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL02  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 13:47  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	1710	98.4	mg/Kg	AK102	A		10/03/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	72.3		%	AK102	A	50-150	10/03/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	80.8		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514046  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL03  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 13:50  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	2540	190	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	62.4		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	50.1		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514047  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL04  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 13:55  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	481	24.5	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	98.3		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	80.5		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514048  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL05  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 13:58  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	1040	226	mg/Kg	AK102	A		10/03/12	10/05/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	80.5		%	AK102	A	50-150	10/03/12	10/05/12	MEM
<b><u>Solids</u></b>									
Total Solids	34.9		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514049  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL06  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 14:02  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	2690	108	mg/Kg	AK102	A		10/03/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	77		%	AK102	A	50-150	10/03/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	73.8		%	SM21 2540G	A			09/29/12	CNP



**SGS Ref.#** 1128514050  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Client Sample ID** DA2-CL07  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Collected Date/Time** 09/19/2012 14:07  
**Received Date/Time** 09/26/2012 10:10  
**Technical Director** Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	2860	137	mg/Kg	AK102	A		10/03/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surrogate>	77.3		%	AK102	A	50-150	10/03/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	72.0		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514051  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL08  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 14:09  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	2700	121	mg/Kg	AK102	A		10/03/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	80.9		%	AK102	A	50-150	10/03/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	82.1		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514052  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL09  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 14:13  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	103	25.0	mg/Kg	AK102	A		10/02/12	10/04/12	MEM
<b><u>Surrogates</u></b>									
5a Androstane <surr>	85.6		%	AK102	A	50-150	10/02/12	10/04/12	MEM
<b><u>Solids</u></b>									
Total Solids	79.8		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1128514053  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Client Sample ID DA2-CL10  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Collected Date/Time 09/19/2012 14:18  
Received Date/Time 09/26/2012 10:10  
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered middle distillate.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
<b><u>Semivolatile Organic Fuels Department</u></b>									
Diesel Range Organics	3760	181	mg/Kg	AK102	A		10/02/12	10/05/12	EAB
<b><u>Surrogates</u></b>									
5a Androstane <surr>	61.7		%	AK102	A	50-150	10/02/12	10/05/12	EAB
<b><u>Solids</u></b>									
Total Solids	43.8		%	SM21 2540G	A			09/29/12	CNP



SGS Ref.# 1118564 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch XXX28121  
Method SW3550C  
Date 09/29/2012

QC results affect the following production samples:

1128514001, 1128514002, 1128514003, 1128514004, 1128514005, 1128514006, 1128514007, 1128514008

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
<b><u>Semivolatile Organic Fuels Department</u></b>					
Diesel Range Organics	ND	20.0	6.20	mg/Kg	10/02/12
<b>Surrogates</b>					
5a Androstane <surr>	82.9	60-120		%	10/02/12
Batch	XFC10632				
Method	AK102				
Instrument	HP 6890 Series II FID SV D F				



SGS Ref.# 1118567 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch  
Method  
Date

QC results affect the following production samples:

1128514001, 1128514002, 1128514003, 1128514004, 1128514005, 1128514006, 1128514007, 1128514008, 1128514009,  
1128514010, 1128514011, 1128514012, 1128514013, 1128514014, 1128514015, 1128514016, 1128514017, 1128514018,  
1128514019, 1128514020

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
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**Solids**

Total Solids	100			%	09/28/12
Batch	SPT8816				
Method	SM21 2540G				
Instrument					



SGS Ref.# 1118661 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch  
Method  
Date

QC results affect the following production samples:

1128514029, 1128514032, 1128514033, 1128514034, 1128514035, 1128514036, 1128514037, 1128514038, 1128514039,  
1128514040, 1128514042, 1128514043, 1128514044, 1128514045, 1128514046, 1128514047, 1128514048, 1128514049,  
1128514050, 1128514051, 1128514052, 1128514053

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
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**Solids**

Total Solids	100			%	09/29/12
Batch	SPT8817				
Method	SM21 2540G				
Instrument					



SGS Ref.# 1118752 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch XXX28132  
Method SW3550C  
Date 10/01/2012

QC results affect the following production samples:

1128514009, 1128514010, 1128514011, 1128514012, 1128514013, 1128514014, 1128514015, 1128514016, 1128514017,  
1128514018, 1128514019, 1128514020, 1128514029, 1128514032, 1128514033, 1128514034, 1128514035

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
<b>Semivolatile Organic Fuels Department</b>					
Diesel Range Organics	ND	20.0	6.20	mg/Kg	10/01/12
<b>Surrogates</b>					
5a Androstane <surr>	77.2	60-120		%	10/01/12
Batch	XFC10626				
Method	AK102				
Instrument	HP 6890 Series II FID SV D F				



SGS Ref.# 1118944 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch  
Method  
Date

QC results affect the following production samples:

1128514021, 1128514022, 1128514023, 1128514024, 1128514025, 1128514026, 1128514027, 1128514028, 1128514030,  
1128514031, 1128514041

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
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**Solids**

Total Solids	100			%	10/01/12
Batch	SPT8819				
Method	SM21 2540G				
Instrument					



SGS Ref.# 1118984 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch XXX28142  
Method SW3550C  
Date 10/02/2012

QC results affect the following production samples:  
1128514037, 1128514052, 1128514053

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
<b><u>Semivolatile Organic Fuels Department</u></b>					
Diesel Range Organics	ND	20.0	6.20	mg/Kg	10/04/12
<b>Surrogates</b>					
5a Androstane <surr>	87.5	60-120		%	10/04/12
Batch	XFC10635				
Method	AK102				
Instrument	HP 6890 Series II FID SV D F				



SGS Ref.# 1119035 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch XXX28143  
Method SW3550C  
Date 10/02/2012

QC results affect the following production samples:

1128514021, 1128514022, 1128514023, 1128514024, 1128514025, 1128514026, 1128514027, 1128514028, 1128514030,  
1128514031, 1128514041

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
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**Semivolatile Organic Fuels Department**

Diesel Range Organics	ND	20.0	6.20	mg/Kg	10/04/12
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**Surrogates**

5a Androstane <surr>	98.7	60-120		%	10/04/12
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Batch XFC10639

Method AK102

Instrument HP 7890A FID SV E F



SGS Ref.# 1119348 Method Blank  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch XXX28150  
Method SW3550C  
Date 10/03/2012

QC results affect the following production samples:

1128514036, 1128514038, 1128514039, 1128514040, 1128514042, 1128514043, 1128514044, 1128514045, 1128514046,  
1128514047, 1128514048, 1128514049, 1128514050, 1128514051

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
<b>Semivolatile Organic Fuels Department</b>					
Diesel Range Organics	ND	20.0	6.20	mg/Kg	10/04/12
<b>Surrogates</b>					
5a Androstane <surr>	83.6	60-120		%	10/04/12
Batch	XFC10639				
Method	AK102				
Instrument	HP 7890A	FID SV E F			



SGS Ref.# 1118568 Duplicate  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Original 1124734003  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch  
Method  
Date

QC results affect the following production samples:

1128514001, 1128514002, 1128514003, 1128514004, 1128514005, 1128514006, 1128514007, 1128514008, 1128514009, 1128514010,  
1128514011, 1128514012, 1128514013, 1128514014, 1128514015, 1128514016, 1128514017, 1128514018, 1128514019, 1128514020

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
<b>Solids</b>						
Total Solids	70.0	71.4	%	2	(< 15)	09/28/2012
Batch	SPT8816					
Method	SM21 2540G					
Instrument						



SGS Ref.# 1118662 Duplicate  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Original 1124754001  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch  
Method  
Date

QC results affect the following production samples:

1128514029, 1128514032, 1128514033, 1128514034, 1128514035, 1128514036, 1128514037, 1128514038, 1128514039, 1128514040,  
1128514042, 1128514043, 1128514044, 1128514045, 1128514046, 1128514047, 1128514048, 1128514049, 1128514050, 1128514051,  
1128514052, 1128514053

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
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**Solids**

Total Solids	85.1	85.7	%	1	(< 15 )	09/29/2012
Batch	SPT8817					
Method	SM21 2540G					
Instrument						



SGS Ref.# 1118945 Duplicate  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Original 1124749001  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch  
Method  
Date

QC results affect the following production samples:

1128514021, 1128514022, 1128514023, 1128514024, 1128514025, 1128514026, 1128514027, 1128514028, 1128514030, 1128514031, 1128514041

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
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**Solids**

Total Solids	67.6	66.9	%	1	(< 15 )	10/01/2012
Batch	SPT8819					
Method	SM21 2540G					
Instrument						



**SGS Ref.#** 1118565 Lab Control Sample  
 1118566 Lab Control Sample Duplicate  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Prep Batch** XXX28121  
**Method** SW3550C  
**Date** 09/29/2012

QC results affect the following production samples:

1128514001, 1128514002, 1128514003, 1128514004, 1128514005, 1128514006, 1128514007, 1128514008

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
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**Semivolatile Organic Fuels Department**

Diesel Range Organics	LCS	139	83	( 75-125 )		167 mg/Kg	10/02/2012
	LCSD	143	86		3	(< 20 )	167 mg/Kg 10/02/2012

**Surrogates**

5a Androstane <surr>	LCS		93	( 60-120 )			10/02/2012
	LCSD		93		1		10/02/2012

**Batch** XFC10632  
**Method** AK102  
**Instrument** HP 6890 Series II FID SV D F



**SGS Ref.#** 1118753 Lab Control Sample  
 1118754 Lab Control Sample Duplicate  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Prep Batch** XXX28132  
**Method** SW3550C  
**Date** 10/01/2012

QC results affect the following production samples:

1128514009, 1128514010, 1128514011, 1128514012, 1128514013, 1128514014, 1128514015, 1128514016, 1128514017, 1128514018,  
 1128514019, 1128514020, 1128514029, 1128514032, 1128514033, 1128514034, 1128514035

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
<b>Semivolatile Organic Fuels Department</b>							
Diesel Range Organics	LCS	166	100	( 75-125 )		167 mg/Kg	10/01/2012
	LCSD	163	98		2 (< 20)	167 mg/Kg	10/01/2012
<b>Surrogates</b>							
5a Androstane <surr>	LCS		92	( 60-120 )			10/01/2012
	LCSD		92		0		10/01/2012

**Batch** XFC10626  
**Method** AK102  
**Instrument** HP 6890 Series II FID SV D F



**SGS Ref.#** 1118985 Lab Control Sample  
 1118986 Lab Control Sample Duplicate  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Prep Batch** XXX28142  
**Method** SW3550C  
**Date** 10/02/2012

QC results affect the following production samples:  
 1128514037, 1128514052, 1128514053

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
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**Semivolatile Organic Fuels Department**

Diesel Range Organics	LCS	141	85	( 75-125 )			167 mg/Kg 10/04/2012
	LCSD	141	84		0	(< 20 )	167 mg/Kg 10/04/2012

**Surrogates**

5a Androstane <surr>	LCS		92	( 60-120 )			10/04/2012
	LCSD		90		2		10/04/2012

**Batch** XFC10635  
**Method** AK102  
**Instrument** HP 6890 Series II FID SV D F



**SGS Ref.#** 1119036 Lab Control Sample  
 1119037 Lab Control Sample Duplicate  
**Client Name** Nortech  
**Project Name/#** Ungalik Airstrip  
**Matrix** Soil/Solid (dry weight)

**Printed Date/Time** 10/10/2012 10:25  
**Prep Batch** XXX28143  
**Method** SW3550C  
**Date** 10/02/2012

QC results affect the following production samples:

1128514021, 1128514022, 1128514023, 1128514024, 1128514025, 1128514026, 1128514027, 1128514028, 1128514030, 1128514031, 1128514041

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
<b>Semivolatile Organic Fuels Department</b>							
Diesel Range Organics	LCS	142	85	( 75-125 )		167 mg/Kg	10/05/2012
	LCSD	146	88		3 (< 20)	167 mg/Kg	10/05/2012
<b>Surrogates</b>							
5a Androstane <surr>	LCS		87	( 60-120 )			10/05/2012
	LCSD		87		0		10/05/2012

**Batch** XFC10640  
**Method** AK102  
**Instrument** HP 7890A FID SV E F



SGS Ref.# 1119349 Lab Control Sample  
1119350 Lab Control Sample Duplicate  
Client Name Nortech  
Project Name/# Ungalik Airstrip  
Matrix Soil/Solid (dry weight)

Printed Date/Time 10/10/2012 10:25  
Prep Batch XXX28150  
Method SW3550C  
Date 10/03/2012

QC results affect the following production samples:

1128514036, 1128514038, 1128514039, 1128514040, 1128514042, 1128514043, 1128514044, 1128514045, 1128514046, 1128514047,  
1128514048, 1128514049, 1128514050, 1128514051

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
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**Semivolatile Organic Fuels Department**

Diesel Range Organics	LCS	149	89	( 75-125 )		167 mg/Kg	10/04/2012
	LCSD	139	83		7	(< 20 )	167 mg/Kg 10/04/2012

**Surrogates**

5a Androstane <surr>	LCS		88	( 60-120 )			10/04/2012
	LCSD		84		5		10/04/2012

Batch XFC10639  
Method AK102  
Instrument HP 7890A FID SV E F



SGS No  
CHAIN OF

1128514



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• North Carolina • Indiana  
• West Virginia • Kentucky  
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1 CLIENT: NORTECH

CONTACT: Jason Ginter PHONE NO: 907-723-8645

PROJECT NAME: Ungalik Airstrip PROJECT/PWSID/PERMIT#:

REPORTS TO: Jason Ginter EMAIL: jginter@nortechengr.com

INVOICE TO: 2400 College Rd. QUOTE #:  
Fairbanks, AK 99709 P.O. #: 12-2101

SGS Reference #:

page 1 of 6

2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE	# CONTAINERS	SAMPLE TYPE	Preservatives Used	Analysis Required	REMARKS/LOC ID
1A	DA3-CL01	9/19/12	1110	S	G	C		X	
2A	DA3-CL02		1114	S	G	C		X	
3A	DA3-CL03		1117	S	G	C		X	
4A	DA3-CL04		1119	S	G	C		X	
5A	DA3-CL05		1122	S	G	C		X	
6A	DA3-CL06		1124	S	G	C		X	
7A	DA3-CL07		1127	S	G	C		X	
8A	DA3-CL08		1128	S	G	C		X	
9A	BG-1A		1000	S	C	C		X	
10A	BG-1B		1000	S	C	C		X	

3

4

5

Collected/Relinquished By: (1) <i>[Signature]</i>	Date 9-25-12	Time 1530	Received By: <i>[Signature]</i>
Relinquished By: (2) <i>[Signature]</i>	Date 9/25/12	Time 4:07pm	Received By: <i>[Signature]</i>
Relinquished By: (3) <i>[Signature]</i>	Date 9-25-12	Time 11:30	Received By: <i>[Signature]</i>
Relinquished By: (4) <i>[Signature]</i>	Date 9/26/12	Time 1010	Received For Laboratory By: <i>[Signature]</i>

4

DOD Project? YES  NO

Data Deliverable Requirements:

Cooler ID \_\_\_\_\_

Requested Turnaround Time and-or Special Instructions:  
STANDARD

Temperature Blank °C: 3.5

Chain of Custody Seal: (Circle)  
INTACT  BROKEN  ABSENT

(See attached Sample Receipt Form)



SGS CHAIN

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D

Locations Nationwide

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1

CLIENT: NORTECH

CONTACT: Jason Ginter PHONE NO: 907-723-8645

PROJECT NAME: Ungalik Airstrip PROJECT/PWSID/PERMIT#:

REPORTS TO: Jason Ginter EMAIL: jginter@nortechengr.com

INVOICE TO: 2400 College Rd. QUOTE #:  
Fairbanks, AK 99709 P.O. #: 12-2101

SGS Reference #:

page 2 of 6

2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE	# CONTAINERS	SAMPLE TYPE	Preservatives Used	Analysis Required	REMARKS/LOC ID
	BG-1C	9/19/12	1000	S		C			
	BG-2A		1430	S		C			
	BG-2B		1430	S		C			
	BG-2C		1430	S		C			
	SS-05A	9/21/12	1330	S		C			
	SS-05B		1330	S		C			
	SS-05C		1330	S		C			
	SS-04A		1312	S		C			
	SS-04B		1312	S		C			
	SS-04C		1312	S		C			

5

Collected/Relinquished By: (1) *[Signature]* Date: 9-25-12 Time: 1530 Received By: Kelly N. C.

Relinquished By: (2) *[Signature]* Date: 9/25/12 Time: 4:07 pm Received By: *[Signature]* 9-25-12 1607

Relinquished By: (3) *[Signature]* Date: 9-25-12 Time: 1630 Received By: *[Signature]*

Relinquished By: (4) *[Signature]* Date: *[Blank]* Time: *[Blank]* Received For Laboratory By: *[Signature]* 9/26/12

DOD Project? YES  NO

Data Deliverable Requirements: *[Blank]*

Cooler ID: *[Blank]*

Requested Turnaround Time and-or Special Instructions: *Standard*

Temperature Blank °C: *35*

Chain of Custody Seal: (Circle) *[Signature]*

INTACT  BROKEN  ABSENT

(See attached Sample Receipt Form)



1 CLIENT: **NORTECH** SGS Reference #: page 3 of 6

CONTACT: **Jason Ginter** PHONE NO: **907-723-8645**

PROJECT NAME: **Ungalik Airstrip** PROJECT/PWSID/PERMIT#:

REPORTS TO: **Jason Ginter** EMAIL: **ginter@nortecheng.com**

INVOICE TO: **2400 College Rd. Fairbanks, AK 99709** QUOTE #:  
P.O. #: **12-2101**

#	CONTAINERS	SAMPLE TYPE C= COMP G= GRAB MI= Multi Incremental Samples	Preservatives Used											REMARKS/ LOC ID			
			Analysis Required														
			③	AK 102 PRO													
21	A	SS-03 A	X														
22	A	SS-03 B	X														
23	A	SS-03 C	X														
24	A	SS-02 A	X														
25	A	SS-02 B	X														
26	A	SS-02 C	X														
27	A	SS-01 A	X														
28	A	SS-01 B	X														
29	A	SS-01 C	X														

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE
	SS-03 A	9/21/12	1255	S
	SS-03 B		1255	S
	SS-03 C		1255	S
	SS-02 A		1244	S
	SS-02 B		1244	S
	SS-02 C		1244	S
	SS-01 A		1230	S
	SS-01 B		1230	S
	SS-01 C		1230	S

5 Collected/Relinquished By: (1) *[Signature]* Date: **9-25-12** Time: **1530** Received By: **Kelley N. [Signature]**

Relinquished By: (2) *[Signature]* Date: **9/25/12** Time: **4:07** Received By: *[Signature]* **9-25-12 1607**

Relinquished By: (3) *[Signature]* Date: **9-25-12** Time: **1630** Received By: *[Signature]*

Relinquished By: (4) *[Signature]* Date: **9/26/12** Time: **9:00** Received For Laboratory By: *[Signature]*

4 DOD Project? YES  NO  Data Deliverable Requirements:

Cooler ID \_\_\_\_\_

Requested Turnaround Time and-or Special Instructions: **Standard**

Temperature Blank °C: **35** Chain of Custody Seal: (Circle) **INTACT**  **BROKEN**  **ABSENT**

**1071** or Ambient [ ] (See attached Sample Receipt Form)



1

CLIENT: **NORTECH**

CONTACT: **JASON GINTER** PHONE NO:

PROJECT NAME: **12-2101 / unstaffed Airship** PROJECT/PWSID/PERMIT#:

REPORTS TO: **Jason Ginter** EMAIL:

INVOICE TO: **NORTECH** QUOTE #:  
P.O. #:

SGS Reference #:

page 4 of 6

2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE	CONTAINERS	SAMPLE TYPE	Preservatives Used	Analysis Required	REMARKS/LOC ID
32A	DA1-CL01	9-19-12	1705	Sed	1	G	X		
31A	DA1-CL02	}	1707	S	1	G	X		
32A	DA1-CL03		1710	S	1	G	X		
33A	DA1-CL04		1711	S	1	G	X		
34A	DA1-CL05		1717	S	1	G	X		
35A	DA1-CL06		1719	S	1	G	X		
36A	DA1-CL07		1723	S	1	G	X		
37A	DA1-CL08		1726	S	1	G	X		
38A	DA1-CL09		1732	S	1	G	X		
39A	DA1-CL10		9-19-12	1734	S	1	G	X	

DROG AK102

3

3

Collected/Relinquished By: (1) [Signature] Date: 9-25-12 Time: 1530 Received By: Kelly N. Z

Relinquished By: (2) Kelly N. C Date: 9/25/12 Time: 4:07pm Received By: [Signature] 9-25-12 1607

Relinquished By: (3) [Signature] Date: 9-25-12 Time: 1635 Received By: [Signature]

Relinquished By: (4) [Signature] Date: [Signature] Time: [Signature] Received For Laboratory By: [Signature]

4

DOD Project? YES  NO

Data Deliverable Requirements:

Cooler ID \_\_\_\_\_

Requested Turnaround Time and-or Special Instructions: Stanoan

Temperature Blank °C: 3.5

Chain of Custody Seal: (Circle) ABSENT

INTACT  BROKEN  ABSENT

(See attached Sample Receipt Form)



<b>1</b> CLIENT: <u>NORTECH</u>					SGS Reference #: _____					page <u>5</u> of <u>6</u>												
CONTACT: <u>J. Ginter</u> PHONE NO: _____					# C O N T A I N E R S	SAMPLE TYPE C= COMP G= GRAB  MI= Multi Incremental Samples	Preservatives Used								Analysis Required							
PROJECT NAME: <u>12-2101 / <sup>ingate</sup> / <sub>Anastop</sub></u> PROJECT/ PWSID/ PERMIT#: _____							3								Dev by H/102							
REPORTS TO: <u>J. Ginter</u> EMAIL: _____																						
INVOICE TO: <u>NORTECH</u> QUOTE #: _____ P.O. #: _____																						
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE	#	TYPE	PRES	ANAL	REMARKS/LOC ID													
(10)	DA1-CL11	8-18-12	1737	S	1	G	X															
(4)	DA1-CL12	8-18-12	1741	S	1	G	X															
(12)	DA1-CL13	8-18-12	1745	S	1	G	X															
(14)	DA1-CL14	8-18-12	1750	S	1	G	X															
(19)	DA2-CL01	8-18-12	1344	S	1	G	X															
(20)	DA2-CL02	8-18-12	1347	S	1	G	X															
(21)	DA2-CL03	8-18-12	1350	S	1	G	X															
(22)	DA2-CL04	8-18-12	1355	S	1	G	X															
(48)	DA2-CL05	8-18-12	1358	S	1	G	X															
(49)	DA2-CL06	8-18-12	1402	S	1	G	X															

Collected/Relinquished By: (1) <u>[Signature]</u>	Date 8-25-12	Time 1530	Received By: <u>Kelly N. C.</u>	DOD Project? YES <input type="radio"/> NO <input checked="" type="radio"/>	Data Deliverable Requirements:
Relinquished By: (2) <u>Kelly N. C.</u>	Date 9/25/12	Time 4:07pm	Received By: <u>[Signature]</u>	Requested Turnaround Time and-or Special Instructions: <u>Standard</u>	
Relinquished By: (3) <u>[Signature]</u>	Date 9-25-12	Time 1630	Received By: _____	Temperature Blank °C: <u>35</u>	
Relinquished By: (4) _____	Date _____	Time _____	Received For Laboratory By: <u>[Signature]</u>	Chain of Custody Seal: (Circle) INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT <input checked="" type="checkbox"/>	





1128514



## SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were <b>custody seals</b> intact? Note # & location, if applicable. COC accompanied samples?	Yes No <u>N/A</u> <u>Yes</u> No N/A	
<b>Temperature blank</b> compliant* (i.e., 0-6°C after correction factor)? <i>* Note: Exemption permitted for chilled samples collected less than 8 hours ago.</i> Cooler ID: <u>1</u> @ <u>3.5</u> w/ Therm.ID: <u>77</u> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ <i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i> If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." <b>If temperature(s) &lt;0°C, were all sample containers ice free?</b>	Yes No <u>N/A</u> <u>Yes</u> No N/A	
Delivery method (specify all that apply): <u>Clean</u> USPS Alert Courier Road Runner AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other: → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	Note ABN/tracking # See Attached or N/A Yes No <u>N/A</u>	
→ For samples received with payment, note amount (\$) and cash / check / CC (circle one) or note: → For samples <b>received in FBKS</b> , ANCH staff will verify all criteria are reviewed.		SRF Initiated by: <u>JP</u> <u>N/A</u>
Were samples received within hold time? <i>Note: Refer to form F-083 "Sample Guide" for hold time information.</i> Do samples <b>match COC*</b> (i.e., sample IDs, dates/times collected)? <i>* Note: Exemption permitted if times differ &lt;1hr; in which case, use times on COC.</i> Were analyses requested unambiguous?	<u>Yes</u> No N/A <u>Yes</u> No N/A <u>Yes</u> No N/A	
Were samples in <b>good condition</b> (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other: <u>boxes</u>	<u>Yes</u> No N/A <u>Yes</u> No N/A	
Were all VOA vials <b>free of headspace</b> (i.e., bubbles ≤6 mm)? Were all soil VOAs <b>field extracted</b> with MeOH+BFB?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
Were <b>proper containers</b> (type/mass/volume/preservative*) used? <i>* Note: Exemption permitted for waters to be analyzed for metals.</i> Were <b>Trip Blanks</b> (i.e., VOAs, LL-Hg) in cooler with samples?	<u>Yes</u> No N/A Yes No <u>N/A</u>	
For <b>special handling</b> (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)? For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was <b>pH verified and compliant</b> ? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No <u>N/A</u> Yes No <u>N/A</u> Yes No <u>N/A</u>	
For <b>RUSH/SHORT Hold Time</b> or <b>site-specific QC</b> (e.g., BMS/BMSD/BDUP) samples, were the COC & bottles flagged (e.g., stickers) accordingly? For RUSH/SHORT HT, was email sent?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No <u>N/A</u>	SRF Completed by: <u>AW</u> PM = <u>N/A</u>
Was <b>PEER REVIEW</b> of <i>sample numbering/labeling</i> completed?	Yes No <u>N/A</u>	Peer Reviewed by: <u>N/A</u>
Additional notes (if applicable):		

Note to Client: Any "no" circled above indicates non-compliance with standard procedures and may impact data quality.



1128514  
SGS WO#

**SAMPLE RECEIPT FORM FOR TRANSFERS**

**Note: This form is to be completed by Anchorage Sample Receiving staff for all shipments received at SGS-Anchorage from SGS-Fairbanks.**

Were samples received numbered with all criteria on Sample Receipt Form F0004 documented by Fairbanks Sample Receiving staff? If "No," Anchorage Sample Receiving staff must complete the receiving process & document pH verification, sample condition, etc. on the SRF initiated by Fairbanks staff (attached).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	Use space below for additional notes...
<b>Review Criteria:</b>	<b>Condition:</b>	<b>Comments/Action Taken:</b>
Were custody seals intact? Note # & location:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	FIR
COC accompanied samples?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Temperature blank compliant (i.e., 0-6°C after correction factor)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler ID: <u>1</u> @ <u>2.3</u> w/ Therm.ID: <u>11</u>		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
<i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i>		
If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank &		
"COOLER TEMP" will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled."		
<b>If temperature(s) &lt;0°C, were all containers ice free?</b>	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Delivery method: <u>Lynden</u>		
Other: _____		
Completed by: <u>Amw</u>		

Appendix D  
Laboratory Data Review Checklist

## Laboratory Data Review Checklist

Completed by:

Title: Ungalik Airstrip                      Date:

CS Report Name:                       Report Date:

Consultant Firm:

Laboratory Name:                       Laboratory Report Number:

ADEC File Number:                       ADEC RecKey Number:

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?  
 Yes    No    NA (Please explain.)                      Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?  
 Yes    No     NA (Please explain.)                      Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?  
 Yes    No    NA (Please explain.)                      Comments:

b. Correct analyses requested?  
 Yes    No    NA (Please explain.)                      Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt ( $4^{\circ} \pm 2^{\circ} \text{C}$ )?  
 Yes    No    NA (Please explain.)                      Comments:

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?  
 Yes    No    NA (Please explain.)                      Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes    No    NA (Please explain.)                      Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes    No     NA (Please explain.)                      Comments:

Not Applicable - No discrepancies were noted

e. Data quality or usability affected? (Please explain.)

Comments:

Not applicable

#### 4. Case Narrative

a. Present and understandable?

Yes    No    NA (Please explain.)                      Comments:

b. Discrepancies, errors or QC failures identified by the lab?

Yes    No    NA (Please explain.)                      Comments:

c. Were all corrective actions documented?

Yes    No    NA (Please explain.)                      Comments:

Corrective actions for some quality issues were not taken. The deviations were reported and the data flagged, but additional documentation regarding the correction of the deviation is not present.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality is impacted, but data is still usable

#### 5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes    No    NA (Please explain.)                      Comments:

b. All applicable holding times met?

Yes    No    NA (Please explain.)                      Comments:

c. All soils reported on a dry weight basis?

Yes     No     NA (Please explain.)

Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

Yes     No     NA (Please explain.)

Comments:

e. Data quality or usability affected?

Yes     No     NA (Please explain.)

Comments:

## 6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes     No     NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

Yes     No     NA (Please explain.)

Comments:

iii. If above PQL, what samples are affected?

Yes     No     NA (Please explain.)

Comments:

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

Yes     No     NA (Please explain.)

Comments:

v. Data quality or usability affected? (Please explain.)

Yes     No     NA (Please explain.)

Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes     No     NA (Please explain.)

Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes No **NA** (Please explain.) Comments:

DRO only

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

**Yes** No NA (Please explain.) Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

**Yes** No NA (Please explain.) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Yes No **NA** (Please explain.) Comments:

RPDs within DQOs

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes No **NA** (Please explain.) Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Yes **No** NA (Please explain.) Comments:

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

**Yes** No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes **No** NA (Please explain.) Comments:

DA3-CL01: AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.  
DA3-CL04: AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.  
DA3-CL06: AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.  
DA1-CL07: AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.  
DA1-CL12: AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes     No     NA (Please explain.)                      Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

Data quality somewhat affected (Bias High) usability unaffected for DA3-CL01, DA3-CL06, DA1-CL07, DA1-CL12. Data quality and usability affected for DA3-CL04, surrogate recovery 0mg/kg, likely due to dilution error; corresponding sample DRO data rejected.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes    No     NA (Please explain.)                      Comments:

DRO samples

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes    No     NA (Please explain.)                      Comments:

See 6i

iii. All results less than PQL?

Yes    No     NA (Please explain.)                      Comments:

iv. If above PQL, what samples are affected?

Comments:

None

v. Data quality or usability affected? (Please explain.)

Comments:

No

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes     No     NA (Please explain.)                      Comments:

Field triplicates submitted.

ii. Submitted blind to lab?

Yes     No     NA (Please explain.)

Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs?  
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where  $R_1$  = Sample Concentration  
 $R_2$  = Field Duplicate Concentration

Yes     No     NA (Please explain.)

Comments:

Seven field triplicates submitted: two triplicate set SS-03A, SS-03B, SS03C and BG-1A, BG-1B, BG-1C did not meet specified DQOs.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

SS-03A: data quality affected; usability affected.

f. Decontamination or Equipment Blank (If not used explain why).

Yes     No     NA (Please explain.)

Comments:

Disposable sampling equipment used

i. All results less than PQL?

Yes     No     NA (Please explain.)

Comments:

ii. If above PQL, what samples are affected?

Comments:

None

iii. Data quality or usability affected? (Please explain.)

Comments:

No

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes

No

NA (Please explain.)

Comments:

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Appendix E  
Conceptual Site Model

## Human Health Conceptual Site Model Scoping Form

**Site Name:** Ungalik Airstrip Drum Site

**File Number:**

**Completed by:** Jason Ginter, NORTECH Inc

### Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

*General Instructions: Follow the italicized instructions in each section below.*

### 1. General Information:

**Sources** (*check potential sources at the site*)

- |  |  |
|--|--|
| <input type="checkbox"/> USTs                          | <input type="checkbox"/> Vehicles  |
| <input type="checkbox"/> ASTs                          | <input type="checkbox"/> Landfills   |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers  |
| <input checked="" type="checkbox"/> Drums              | <input type="checkbox"/> Other: <input style="width: 200px; height: 20px;" type="text"/> |

**Release Mechanisms** (*check potential release mechanisms at the site*)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge  |
| <input checked="" type="checkbox"/> Leaks  | <input type="checkbox"/> Burning   |
|  | <input type="checkbox"/> Other: <input style="width: 200px; height: 20px;" type="text"/> |

**Impacted Media** (*check potentially-impacted media at the site*)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input type="checkbox"/> Groundwater   |
| <input type="checkbox"/> Subsurface soil (>2 feet bgs)           | <input type="checkbox"/> Surface water   |
| <input type="checkbox"/> Air                                     | <input type="checkbox"/> Biota   |
| <input type="checkbox"/> Sediment                                | <input checked="" type="checkbox"/> Other: <input style="width: 200px; height: 20px;" type="text" value="250 cy of land-spread material"/> |

**Receptors** (*check receptors that could be affected by contamination at the site*)

- |   |  |
|---|--|
| <input type="checkbox"/> Residents (adult or child)                                 | <input checked="" type="checkbox"/> Site visitor   |
| <input type="checkbox"/> Commercial or industrial worker                            | <input type="checkbox"/> Trespasser  |
| <input type="checkbox"/> Construction worker  | <input type="checkbox"/> Recreational user   |
| <input checked="" type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer  |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods)                | <input type="checkbox"/> Other: <input style="width: 200px; height: 20px;" type="text"/> |

**2. Exposure Pathways:** *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

*If the box is checked, label this pathway complete:*

Complete

Comments:

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

## 2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

## 3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

*If all of the boxes are checked, label this pathway complete:*

Incomplete

Comments:

### c) Inhalation-

#### 1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

## 2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

**3. Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

**Dermal Exposure to Contaminants in Groundwater and Surface Water**

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**Inhalation of Volatile Compounds in Tap Water**

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM<sub>10</sub>). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**4. Other Comments** (*Provide other comments as necessary to support the information provided in this form.*)

Appendix F  
2012 Corrective Action Plan

# CORRECTIVE ACTION PLAN

## UNGALIK AIRSTRIP DRUM SPILL SITE AT UNGALIK AIRSTRIP UNGALIK, ALASKA

**JULY 2012**

Prepared For:

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## **1.0 EXECUTIVE SUMMARY**

**NORTECH** Environmental Engineering and Industrial Hygiene (**NORTECH**) completed this Corrective Action Plan for the United States, Bureau of Land Management's (BLM) Ungalik Airstrip Drum Spill Site Hazmat Removal Project (Contract #GS10F0150R).

In 1993, an estimated 150 drums were reported to be found on the south end of the airstrip as well as scattered around the site. 1995 the BLM noted that most of the drums were empty, but some were filled with fuel and some were leaking. In 2003 and 2004, the BLM, in conjunction with a nearby privately owned mining property and several residents of Shaktoolik, removed the drums from the site. A final count of 71 empty drums and 54 drums containing diesel fuel #2 were removed from the site and taken to Shaktoolik for disposal.

In August 2007, Ecology and Environment, Inc. performed a Limited Site Characterization and identified four areas of concern. Field screening and soil sampling indicated diesel contamination of up to 59,400 milligrams per kilogram located at the south end of the airstrip.

In 2008, MACTEC and their subcontractor used Geoprobe equipment to delineate the contaminated areas, and to determine if groundwater was present to determine the appropriate cleanup criteria. Four separate areas were determined to require remediation. This Corrective Action will focus on the areas as identified in these previous investigations.

## **2.0 PROJECT LOCATION AND BACKGROUND**

### **2.1 Site Location and Description**

The Ungalik Airstrip (the Site) is located immediately north of the Ungalik River and lies 4 miles east of Norton Bay in Western Alaska. The Site is located within Sections 1 and 12, Township 11 South, Range 11 West, Kateal River Meridian at 64° 32'52.0" North, 160° 47' 30.6" West. The Site is on federal land administered by the US Bureau of Land Management (BLM). The nearest known inhabited area is Shaktoolik Alaska, 18.75 miles southwest of the site. There are no roads leading to or from the site.

### **2.2 Initial Investigation**

On August 16 and 17, 2007 Ecology and Environment, Inc (E&E) completed a limited Site Characterization Assessment of the Ungalik Airstrip Drum Spill Site. During this time E&E collected a total of 23 surface and subsurface soil samples for field screening





and laboratory analysis of Diesel Range Organics (DRO), Residual Range Organics (RRO), Gasoline Range Organics (GRO) and Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX). The objective of this sampling was to identify and characterize areas of contamination caused by the stored leaking drums. Laboratory analysis of the samples showed results as high as 59,400 milligrams per kilogram (mg/kg) for DRO.

E&E identified three drum storage areas where diesel contamination is present. Those areas are identified as Drum Area 1 (DA1), 2 (DA2) and 3 (DA3). E&E also identified an area of contamination west of Drum Area 2 identified as the Dead Vegetation Area (DVA). These four areas are estimated to contain 50-100 cubic yards of diesel contaminated material.

In 2008, MACTEC used Geoprobe equipment in an attempt to delineate the diesel contaminated areas at the site, determine if groundwater is present at the site, and to develop a target cleanup level for the site based on the State of Alaska Department of Environmental Conservation (ADEC) regulations. MACTEC found that no groundwater is present at the Ungalik Airport site. MACTEC proposed a cleanup level of 10,250 mg/kg DRO, based on the Method Two Cleanup levels for the Ingestion pathway in the Under 40 inch Zone. This cleanup level has been approved by ADEC.

### 2.3 Objectives and Scope of Work

**NORTECH** and the BLM are working together to assess and remediate the contaminated soils from the Drum Storage areas and the Dead Vegetation area identified at the Ungalik Airstrip Drum Spill Site. **NORTECH** will direct the excavation sub-contractor in the removal of diesel contaminated materials from the four areas identified during previous site investigations by E&E and MACTEC. **NORTECH** will develop and execute a Maintenance and Monitoring (M&M) Plan for the land spread treatment cell. Included in this plan will be annual monitoring of the progress for four years after the initial baseline work.

**NORTECH** will collect baseline samples of the former airstrip using multi-incremental sampling techniques, following the ADEC draft Guidance on Multi Increment Soil Sampling, which will be used as the land spread area. Excavation of contaminated soils will be performed from the DA1, DA2, DA3, and DVA areas, using an excavator and bulldozer rented from the neighboring mining claim. **NORTECH** will conduct field screening and soil sampling concurrent with this effort to ensure that all contaminated soils above 10,250 mg/kg are removed.

Excavations will be backfilled with clean backfill, and graded to drain and prevent pooling and or unsafe conditions. Fill will be obtained from the berms on the old airstrip





or other nearby sources on BLM lands. **NORTECH** personnel will be onsite during all field efforts including final inspection.

**NORTECH** will submit a draft final report to ADEC and BLM for a 30-day review period. Upon approval, a final summary report will be provided.

## 2.4 Project Schedule

**NORTECH**'s goal is to have the site assessment and remediation work completed in September 2012 with the final Site Assessment and Remediation Report completed by October 2012. Based on discussions with BLM personnel, a draft schedule has been developed for the project with major milestones outlined below.

Project Milestone	Anticipated Date
Submit Corrective Action Plan	July 2012
Finalize Corrective Action Plan	July 2012
Site Assessment and Remediation Field Work	September 2012
Site Assessment and Remediation Report	October 2012

## 2.5 Record Keeping and Reporting

**NORTECH** uses a number of different methods for keeping records and reporting project activities. The most detailed of these is the field notebook that is compiled by the crew during field activities. This contains information about the job, personnel and equipment onsite, weather conditions, work activities performed, field tests and results, laboratory sample collection, discussions with inspectors, quantities of materials moved and/or collected, occurrence of site meetings, photo log, and other relevant information.

This field notebook information is then transferred into a detailed Corrective Action Final Report for submittal to ADEC and the BLM.





## 2.6 Data Quality and Submittal Requirements

The project manager is responsible for the collection of quality data during the project and will review project data prior to delivery to ADEC and DOA. In the event that specific quality assurance and/or quality control issues arise, the project manager may request the assistance of the QA/QC manager.

Submittal requirements for the Site remediation work are as follows:

- Draft and Final Correction Action Plan
- Draft and Final Site Assessment and Remediation Report

## 3.0 KEY PERSONNEL

### 3.1 Project Organization

The project will be executed by **NORTECH** and its subcontractors under the direction of **NORTECH**'s project manager and site supervisor. **NORTECH** anticipates that BLM will provide an on-site Project Inspector during the site assessment and remediation phases of the project that will verify the work is being completed according to the plans. The **NORTECH** site supervisor/Site Safety and Health Officer (SSHO) will work closely with BLM personnel to identify land spreading locations for project materials and other matters related to operations at the site. An organizational chart is included below.

Title	Name	Organization, Telephone
Contract Manager	John Hargesheimer, PE CIH	<b>NORTECH</b> , (907)452-5688
Contracting Officer	Nicole Noyes	BLM, (907) 271-4440
Project Manager	Jason Ginter	<b>NORTECH</b> , (907)586-6813 cell (907)723-8645
Quality Assurance Manager	Peter Beardsley, PE	<b>NORTECH</b> , (907)452-5688
Project Inspector	Larry Beck	BLM, (907) 267-1226
Site Safety and Health Officer (SSHO) and Site Supervisor	Jason Ginter	<b>NORTECH</b> , (907)586-6813 cell (907)723-8645





### 3.2 Personnel Responsibilities and Authority

The **NORTECH** project management objective is to provide experienced workers to the project as well as provide management with the site-specific information that is necessary to make informed decisions. Direction and administration of the program is performed through the project manager with input from the contract manager and quality assurance manager. All **NORTECH** personnel involved in the project are ADEC Qualified Environmental Samplers. Specific responsibilities and authority for project personnel are described below.

#### 3.2.1 Project Manager (PM)

The Project Manager is responsible for achieving the project objectives in a smooth, efficient, and safe manner. He has authorization capability under the contract to direct fieldwork as necessary to complete the project and will manage the budget, field, and office support necessary for the project. His specific responsibilities include:

- Primary point of contact with BLM and ADEC personnel
- Direct day-to-day activities for the project, including preparation of project documents, field activities, and reporting activities
- Determine schedule and assign personnel for specific job tasks
- Coordinate subcontractors and suppliers
- Oversee technical content of project activities to meet project objectives
- Oversee and manage project budget constraints
- Oversee safety and health program for the project, including submittals

#### 3.2.2 Site Safety and Health Officer (SSHO)

The SSHO is responsible for project operations and site activities and is responsible for promoting safe work practices, as well as stopping work when a hazard is observed. The SSHO will confer with the BLM and ADEC inspectors on safety issues and the BLM and ADEC inspectors also have the authority to shut down the project if worker or public safety is compromised. Specific SSHO activities include:

- Ensure that the project is performed in a manner consistent with the Health and Safety Plan (HSP, attached)
- Coordinate with the PM on safety matters
- Ensure that contractor personnel are in compliance with the HSP and observe and obey the rules and requirements necessary to maintain a safe workplace





- Make sure that daily briefings include potential safety issues and that each employee signs off that the daily briefing was attended
- Control the site in the event of injury, near miss, or IDLH condition and assign responsibilities during emergency procedures
- Report all safety-related incidents or accidents to project manager and complete accident investigations of injuries, illnesses, and other issues
- Direct and monitor safety and health activities on site
- Maintain safety and health equipment on site

### 3.2.3 Site Supervisor/ADEC Qualified Person

All **NORTECH** personnel proposed for this project are ADEC Qualified Person and have the qualifications to be site supervisor. In general, the responsibilities of this position are execution of the sampling and analysis plan, including:

- Directing excavation activities through field screening using visual means and a PhotoVac Combo Pro 2020 PID as indicated
- Collect laboratory samples, sign COCs, package coolers, and coordinate sample delivery with project laboratory
- Record project activities in field notebook

## 4.0 SITE SPECIFIC ACTIVITIES

This section describes the planned site assessment and remediation work. These planned activities are based on the site conditions that were observed in project documents and **NORTECH's** experience completing similar work. The specific methods and activities may be modified in the field as necessary with appropriate documentation and reporting to successfully and safely complete the objectives of the project.

### 4.1 Site Assessment and Remediation Field Work

The site assessment and remediation at the Ungalik Airstrip Drum Spill Site is anticipated to include the following:

- Collect baseline samples of the land spread area.
- Removal of about 50-100 cubic yards of contaminated soil from the four areas previously identified.
- Spread contaminated soil without a liner over the existing site airstrip surface to a depth of six inches or less.





- 
- Collect soil samples from the limits of the excavated areas for closure.
  - Conduct multi increment sampling of the land spread soil to establish initial conditions.

**NORTECH** will collect field-screening samples using a PhotoVac Combo Pro 2020 PID to guide the removal of soil as needed. Soil samples will be collected using hand tools.

#### 4.2 Site Assessment and Remediation Procedures

**NORTECH** personnel will begin site assessment and remediation work by locating the soil sample areas from the previous investigations. **NORTECH** will then direct the excavation and removal of the identified contaminated material. Removal of contaminated soil will continue until field screening results show that all soils with a DRO concentration above the established site-specific clean up levels have been removed. **NORTECH** personnel will then screen the excavation side walls at a rate of one sample every 10 linear feet within the soil horizon most likely to contain contamination to document the conditions of soils left in place. A soil sample will be collected every 20 linear feet for confirmation laboratory analysis of DRO content.

The FAA Alaska Land Spreading Design Manual will be used to guide land spreading operations. The land spreading area of the former landing strip will be prepared by grubbing and clearing the land strip. Based on topography and actual site conditions, the land spread area will be graded to prevent water run on/run off. Qualified **NORTECH** personnel will perform baseline sampling on the Ungalik Airstrip prior to land spreading to establish background levels. **NORTECH** anticipates that 50-100 but not exceeding 200 cubic yards of contaminated soils will be removed from the Drum Storage and Dead Vegetation areas. These soils will be placed on the Ungalik airstrip and spread to a depth of six inches or less.

After soils have been land spread to a depth of six inches or less, **NORTECH** will conduct multi incremental soils field screening and sampling of the land to establish initial conditions and assess the attenuation progress. **NORTECH** will select the samplings areas at random and using hand tools, obtain samples from various depths throughout the land spread area. Fifty grab samples will be collected, combined and homogenized. From this, **NORTECH** will collect one 100g analytical sample. As the total volume of material will be determined upon excavation, the total number of analytical samples will be determined post excavation. If the excavated volume is between 100 cubic yards and 150 cubic yards, three sets of 50 grab samples are collected during initial sampling.





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### 4.3 Land Spread Area Monitoring and Maintenance

**NORTECH** proposes to visit the site annually in late summer for four years after the completion of the excavation to monitor the progress of the natural attenuation of the land spread material. Multi increment sampling is the methodology chosen to assess the attenuation progress towards the cleanup goal of 10,250 mg/Kg DRO. **NORTECH** will divide the sampling area into 50 equally sized subareas. **NORTECH** will use freshly decontaminated hand tools such as shovels, post-hole diggers and a hand auger to obtain samples from various depths throughout the land spread area. The fifty grab samples are then combined and homogenized the soil breaking up any clumps and removing rocks and debris. From the mixed soil samples, one 100g analytical sample is collected as well as one 100g duplicate and triplicate will be sent blind to the lab for analysis.

As the total volume of material will be determined upon excavation, the total number of analytical samples will be determined post excavation. If the excavated volume is between 100 cubic yards and 150 cubic yards, three sets of 50 grab samples are to be collected during each annual sampling event.

In addition, the land spread soils will be marked with signs identifying the Site as having contaminated surface soils and warning of dermal contact and ingestion hazards. These signs will be maintained at the land spread area until the site is closed with ADEC, at which time the signs will be removed, as outlined in the FAA Land spreading Design Manual. Based on topography and actual site conditions, the land spread area will be graded to prevent water run on/run off.

**NORTECH** will finalize and detail the Site Monitoring and Maintenance Plan after the remediation project, to determine the number of annual field screening and laboratory samples collected based on the total amount of material excavated and added to the land spread area.

### 4.4 Field Screening Methodology

**NORTECH** proposes to use the PID for field screening in the following manner:

Headspace screening consists of partially (33%-50%) filling a clean resealable bag with freshly uncovered soils to be field screened. The total capacity of the bag will not be less than 8 ounces (app. 350 ml).

The re-sealable bag is closed and headspace vapors are allowed to develop for at least 10 minutes and not more than one hour. The bag will be agitated at the beginning and





end of the headspace development period. The soil and headspace will be tested at a temperature of at least 40° F (5° C). A small opening will be made in the top of the bag and the PID probe will be inserted into the bag. Headspace vapors will be drawn from the center of the space above the soils and analyzed by the PID for total volatile organic compounds. The highest PID reading from each sample will be recorded in the project field notes for inclusion in the final report.

Calibration will be performed in accordance with the manufacturer's specifications. In the event that background air contamination is encountered, it will be zeroed out by performing the calibration in an alternate location without contamination, or by utilizing uncontaminated calibration air. The calibration of the PID will be checked at the beginning and end of each day and at least every four hours during continuous use. Calibration and calibration checks will also be recorded in the field log.

#### 4.5 Laboratory Sampling Plan

**NORTECH** personnel collect soil samples using clean sampling equipment and place them directly into glassware provided by the laboratory. After collection, samples are assigned a unique identification number and placed into a cooler with ice for transportation under chain-of-custody to an ADEC approved laboratory. **NORTECH** submits samples to SGS Laboratory, in Anchorage, Alaska for analysis of contaminants of concern (COCs). A Sampling and Analysis Plan is attached. The following list of COCs have been identified for this Site:

- Diesel Range Organics (DRO) by Method AK102

#### 4.6 Regulatory Limits

The ADEC Method Two cleanup levels for soil are typically used as cleanup goals for sites managed through the ADEC contaminated sites program. ADEC has developed the Method 2 cleanup levels to be protective of human health and the environment under the wide range of conditions found in Alaska. These cleanup levels are provided in 18 AAC 75. This Corrective Action Plan uses Method Two soil cleanup levels for Ingestion in an Under 40 Inch Zone to evaluate soil conditions at this Site. The cleanup levels for DRO in soil at the limits of the excavation will be **10,250 mg/kg** DRO. Land spread soils will be required to achieve **250 mg/Kg**.

#### 5.0 REPORTING

The site assessment report will document the field activities of the remediation effort, present the laboratory results, and will include figures to indicate where affected





materials have been removed and the location of collected field screening and laboratory samples. The anticipated completion dates for the draft and final site characterization reports are outlined in the schedule discussed earlier.

## 6.0 LIMITATIONS

While **NORTECH** believes that the activities and methods described in this work plan are appropriate, reasonable alternative field procedures may be utilized to perform the activities necessary under this contract. Alternative procedures may be necessary based on changes that have occurred on the site, unforeseen site conditions, and/or changes in **BLM** or **ADEC** requirements. If necessary, alternative methodology utilized by **NORTECH** will be appropriate, safe, within industry standards, and approved by **ADEC** as necessary.

**Jason Ginter**, Juneau Technical Manager for **NORTECH**, has a B.S. in Chemistry and extensive experience conducting site remediation, hazardous materials investigations, property assessments, and other environmental fieldwork throughout Alaska.

A handwritten signature in black ink, appearing to read "Jason Ginter".

Principal, Juneau Technical Manager



Appendix G  
Project Health and Safety Plan



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## HEALTH AND SAFETY PLAN

# Site Corrective Action Ungalik Airstrip Drum Spill Site Ungalik, Alaska

### 1. SITE SPECIFIC INFORMATION

The Ungalik Airstrip (the Site) is located immediately north of the Ungalik River and lies 8.75 miles east of Norton Bay in Western Alaska. The Site is located within Sections 1 and 12, Township 11 South, Range 11 West, Kateal River Meridian at 64° 32'52.0" North, 160° 47' 30.6" West. The Site is on federal land owned and managed by the US Bureau of Land Management (BLM). The nearest inhabited area is Shaktoolik Alaska, 18.75 miles southwest of the site. There are no roads leading to or from the site.

### 2. PROJECT OBJECTIVES

Up to 200 cubic yards (cy) of diesel contaminated soil may be excavated as part of the Site corrective action. Excavation will be performed with an excavator and bulldozer. The excavated soils will be stockpiled and spread for remediation via Landfarming on the Ungalik Airstrip.

### 3. CHEMICAL HAZARDS

Diesel fuel (same as heating oil or fuel oil #2) in the tank can cause skin irritation, dizziness, headache, and nausea. Mist from diesel fuel can cause *permanent* damage to the lungs if inhaled.

### 4. SAFETY AND HEALTH ANALYSIS

Physical Hazards include slips, trips, falls; trenches; buried scrap and debris; heavy equipment; and so forth. Dizziness from vapors may aggravate danger from physical hazards.

Wild Animal Encounters: The project site is remote and has the potential for encounters with hazardous wildlife (bear and moose). The BLM PI is authorized and will be armed with a firearm for wild animal defense. The mining camp, located near the project site will be used for camping and food preparation. All site personnel should be familiar with bear safety procedures prior to arriving on site. Bear safety procedures are available for review at the Alaska, BLM web site. Should a dangerous animal approach the work site, the person that identifies the animal should alert others to the approach. Bear



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spray will be provided for personal protection by **NORTECH** Environmental. Instruction as to the use of bear spray will be provided by the Health and Safety Officer

Food will be placed in secure area at the mine camp while on site. Food will not be taken into the work area. Prompt cleanup after meals and appropriate disposal of food waste. The Health and Safety Officer is responsible for assuring that food and food waste is secured.

Exposure: Hypothermia is a risk at the site. Cold and wet conditions are anticipated at the project site due to its location and the time of year the project is scheduled. Site personnel are trained in recognizing the symptoms of hypothermia and its prevention. Appropriate clothing will be worn at all times. Project personnel will have a change of clothing in their personal equipment specifically for use should

Personal Protective Equipment: Level D (safety glasses, hard hats, rain gear, rubber gloves); optional respirators depending upon individual sensitivity.

Confined Spaces: Hydrocarbon vapors may build up in trenches, excavations and pits, but oxygen and explosive limits will not present hazards. Entry permits are not required, but air monitoring for hydrocarbons may be needed upon release of vapors from exposure of heavily contaminated oily soils.

Fire: Fire is always a possibility in the work environment. A fire extinguisher will be present within ten feet of the cook stove. The health and safety officer will provide the fire extinguisher for camp use.

Permissible Exposure Levels:

OSHA PEL Distillate Vapors = 400 ppm (diesel fuel)

Decontamination: If skin comes in contact with fuels, use soap and water or handcleaner to remove it. If fuel soaks into clothing, remove the oily clothing and clean skin. Clean boots and raingear with soapy water before leaving the oily work area.

## **5. PROJECT ORGANIZATION**

Al Vezey, Lakloey, Inc., is the heavy equipment sub-contractor for this project.

Larry Beck, BLM, is the inspector for this project.

Jason Ginter, **NORTECH** Environmental, Site Supervisor and in charge of site activities.

Jason Ginter, **NORTECH** Environmental, will collect samples from the soils surrounding the spill site, and submit them to a laboratory to determine if there is petroleum contamination in the soil. Jason will prepare the pre- and post-closure reports as required by ADEC. He is also the Site Health and Safety Officer for this project.



## **6. EMERGENCY ASSISTANCE INFORMATION**

### Emergency Contacts

Alaska State Troopers	(907) 465-4000
Shaktoolik Public Safety Department	(907) 955-3661
NSHC Euksavik Clinic, Unalakleet	(907) 624-3073
Shaktoolik Clinic	(907) 955-3311
24hr Emergency Medical Facility, Norton Sound Health Corp, (NSHC) Hospital Nome	(907) 443-3311
Shaktoolik Volunteer Fire Dept	(907) 955-3661
USCG Spill Reporting (national response center)	1-800-424-8802
AK Dept Environmental Conservation (24 hours, 7 days)	1-800-478-9300
US EPA	(907) 271-5083
CHEMTREC	1-800-424-9300

### Directions to nearest hospitals:

Due to the remote location of the site, air evacuation may be necessary in the case of a medical emergency. In the case of serious medical emergency the Health and Safety Officer will contact the Emergency Medical Facility at the Norton Sound Health Corp by sat. phone (907) 443-3311 to arrange a medevac. In the case of a minor injury the preferred evacuation is to the NSHC Euksavik Clinic, Unalakleet (907) 624-3073.

### Evacuation Plan

All site personnel will be evacuated if the Emergency Coordinator decides that their personal safety is in danger. If evacuation is necessary personnel will be notified by the continuous horn blast for a period of one minute. The following procedures will apply.



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Personnel in the Exclusion Zone (EZ) will proceed to the Chemical Reduction zone. Normal decontamination procedures will apply for affected personnel, unless the decontamination area is deemed unsafe.

Personnel not requiring decontamination, or located in the Support Zone, will proceed immediately to the most north west corner of the property, the project designated assembly area, and check in with a checkpoint control person.

The Buddy System should be followed throughout the evacuation procedure.

If there is an injury in the Exclusion Zone or Chemical Reduction Zone, a continuous horn blast will be sounded as an emergency signal. Entry into the exclusion zone for rescue purposes will be done so only in teams with appropriate PPE under the direction of the Health and Safety Officer. The Health and Safety Officer will evaluate the nature of the injury and call for an ambulance if needed, and the affected person will be decontaminated to the extent possible prior to movement to the Support Zone. Appropriate first aid will be administered. No persons shall re-enter the Exclusion Zone until the cause of the injury or symptom is determined.

Upon notification of an injury or incident in the Support Zone, the designated emergency signal (continuous horn blast) shall be sounded, and all site personnel shall move in accordance with the Evacuation Plan procedures above. The Health and Safety Officer will assess the nature of the situation. Activities on-site will stop until the added risk is removed or minimized.

Upon notification of a fire or explosion on-site, a continuous horn blast will be sounded, and all site personnel will assemble and evacuate as described in the Evacuation Plan procedures above. The fire department must be alerted and all personnel moved as soon as possible to a safe distance.

Should complete evacuation from the site become necessary: the mining camp will be used to coordinate site the site evacuation.

### Personal Protective Equipment Failure

If any site worker experiences a failure or alteration of protective equipment, which may alter the protection factor, he/she and his/her buddy must immediately leave the Exclusion Zone. Re-entry shall not be permitted until the equipment has been appropriately repaired or replaced.

### On-site Emergency Facilities



Cell phone/radio/telephone	_____	(location)
First Aid Kit and reference manual	_____	(location)
Fire extinguisher	_____	(location)

Sat Phone: BLM PI will have an Iridium 9505 sat phone, Number 8816-224-21260

On-site Emergency Personnel

The following personnel have been trained in specific fields of emergency response and are present on the site during the normal working day:

First Aid Technicians:  
 \_\_\_\_\_  
 \_\_\_\_\_

Fire Brigade:  
 \_\_\_\_\_  
 \_\_\_\_\_

Hazardous Materials Discharge

In the event of an unauthorized discharge of pollutants and contaminants into the soil, surface water, sewers, or ambient air, the person first finding such an incident should immediately notify the Site Supervisor or the Safety and Health Officer. The Site Supervisor will immediately notify appropriate regulatory agencies listed above. Spill kits including adsorbent pads will be prepared by **Nortech** and placed in on the excavation equipment for immediate used should a spill occur.

Special Procedures

In the event personnel become contaminated in the emergency or are injured while contaminated and require medical treatment, the Safety Officer will provide including instructions for ambulance crews and hospital personnel specific emergency decontamination procedures.



**ENVIRONMENTAL ENGINEERING, HEALTH & SAFETY**

Anch: 3105 Lakeshore Drive, Ste 106A, 99517 907.222.2445 Fax: 222.0915

Juneau: 4402 Thane Road, 99801 907.586.6813 Fax: 586.6819

Fairbanks: 2400 College Rd, 99709 907.452.5688 Fax: 452.5694  
info@nortechengr.com www.nortechengr.com

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**7. NON-EMERGENCY ASSISTANCE INFORMATION**

Non-emergency Contacts

Peter Beardsley, <b>NORTECH</b> Environmental	907-452-5688
<b>NORTECH</b> Environmental Office - Juneau	907-586-6813
BLM, Anchorage Field Office	800-478-1263



**8. TAILGATE SAFETY MEETING FORM**

**HEALTH AND SAFETY PLAN  
 Tailgate Safety Meeting Form**

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Project: \_\_\_\_\_

Subjects Discussed: \_\_\_\_\_

\_\_\_\_\_

Accidents Reviewed: \_\_\_\_\_

Suggestions Offered: \_\_\_\_\_

\_\_\_\_\_

Action Taken: \_\_\_\_\_

\_\_\_\_\_

Signed:

\_\_\_\_\_  
 (signature)

\_\_\_\_\_  
 (date)

\_\_\_\_\_  
 (signature)

\_\_\_\_\_  
 (date)

\_\_\_\_\_  
 (signature)

\_\_\_\_\_  
 (date)

\_\_\_\_\_  
 (signature)

\_\_\_\_\_  
 (date)

\_\_\_\_\_  
 (signature, Site Supervisor)

\_\_\_\_\_  
 (date)



## 9. COMPREHENSIVE INFORMATION

Emergency Response: If you find any unknown or strange substances or leaking buried drums, **warn everyone** in the area, **move upwind**, and notify the Site Supervisor or Safety Officer. Use a **long horn blast** to signal an emergency.

Use the Buddy System. **Keep an eye out for your Buddy** and everyone else in the work area. Ask your fellow workers if they're feeling dizzy or getting headaches.

Make eye contact with heavy equipment operators and use established hand signals to make sure you are understood.

Do not smoke, eat, or drink in Exclusion Zones. After leaving the EZ, do not smoke, eat, or drink until you've washed your hands and properly decontaminated yourself.

Lessen your exposure. Do not stand around the EZ unless you have work.

Keep Clean. Don't track contamination out of the work area and don't bring oily gear home to contaminate your family. Use soap and water on your boots and raingear when you leave an oily area. Put oily towels, clothes, and rags in garbage bags.

Wash oil off your skin right away with soap and water. If you get oil in your eyes, **flush your eyes with water for 15 minutes.**

Slow down if you feel dizzy or get a headache. Clear out of the work area and take a break. If conditions change and result in a noticeable release of heavy vapors, take a break and allow the vapors to go away. Call for air monitoring if the vapors persist.

**Very low levels of alcohol can cause extreme reactions combined with inhalation of certain solvents.** Do not come to this kind of job with a hangover. Use of illegal drugs or alcohol at job sites is strictly forbidden. If you're on medication or if you have a cold or the flu, do not work where hydrocarbon vapors are present.

Be sure to mention any ill effects or unusual events at your daily Safety Meeting.

### Respirator program

Respirators shall be selected on the basis of hazards to which the worker is exposed. The user shall be instructed and trained in the proper use of respirators and their limitations. Respirators shall be regularly cleaned and disinfected. Respirators shall be stored in a convenient, clean, and sanitary location. Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use.



## Communication Procedures

A horn blast is the emergency signal to indicate that all personnel should follow the Emergency Contingency Plan procedures.

Site personnel will use handheld VHF radios.

## **10. ANTICIPATED HAZARDS AND RISK PREVENTION**

Moderate **physical hazards** are present at this job site, including the following:

Vehicle hazards while traveling to and from job sites. All employees must employ safe driving habits. Vehicles should not exceed posted speed limits or safe operating speeds. Operation of company vehicles shall be in accordance with all applicable vehicle laws and ordinances. These hazards are also aggravated by dizziness and loss of coordination that are associated with breathing hydrocarbon vapors.

Because of steep and uneven terrain with uncertain footing, **slips, trips, and falls** can occur. Proper footwear and caution are necessary. Slips, trips, and falls are the most common injury encountered in oil spill cleanups and are often aggravated by oily ground and walking surfaces. These hazards are also aggravated by dizziness and loss of coordination that are associated with breathing hydrocarbon vapors.

Electrical cables near job sites, both underground and overhead, may be encountered. These will be located, identified, and marked.

Temperature extremes, and stress because of heat and cold must be considered. PPE traps heat and may raise body temperature levels. Appropriate dress is required.

Heavy equipment such as front-end loaders, dump trucks and backhoes will be used during this project. Because of noise and reduced vision of equipment operators, all employees will use extreme care when working around heavy equipment. These hazards are also aggravated by dizziness and loss of coordination that are associated with breathing hydrocarbon vapors.

Excavation, trenching in excess of four feet will be required. Appropriate engineering controls may be required to include shoring, stepping, barriers and fencing, and emergency access. Pits and excavations can be considered confined spaces where hydrocarbon vapors can build in them. These hazards are also aggravated by dizziness and loss of coordination that are associated with breathing hydrocarbon vapors. Do not enter trenches or pits to take samples if backhoe buckets or long handled samplers are available.



Lifting of heavy objects is a safety consideration and employees shall do so in a safe and appropriate manner. Use of light equipment such as chain saws, soil compactors, and hand tools such as picks, augers, post hole diggers, and shovels can result in injuries.

Site debris of various kinds such as lumber, sharp objects, scrap metal, and other solid wastes may be present and pose a hazard.

**Chemical hazards** should be limited to petroleum hydrocarbon fuels. Toxic levels above established Permissible Exposure Limits (PEL) and Immediately Dangerous to Life and Health (IDLH) *should not occur*. Periodic air monitoring will not be conducted.

Material Safety Data Sheets (MSDS) will be available for this project and MSDSs for diesel fuel (chemically the same as heating oil) and gasoline have been attached as appendices to this SHP.

Irritation to the skin from contact with petroleum hydrocarbons is a health hazard. The skin will dry out and chafe, becoming red and irritated. Hydrocarbon vapors can also cause red blotchy skin, sometimes known as painters blush.

Eye contamination from exposure to hydrocarbons or particles of oily soil is a potential hazard. Immediate action must be taken for first aid, including **flushing the eyes with water for a minimum of 15 minutes. Contact lenses will not be worn in the Exclusion Zone.**

Individual sensitivity: some workers are extremely sensitive to petroleum hydrocarbons and may exhibit skin rashes, nausea, and headaches at low vapor concentrations. These workers should be assigned to other duties or provided with optional personal protective equipment.

In the event additional chemicals are encountered, all site activities will cease and employees will evacuate the area (with decontamination). The Site Supervisor and Health and Safety Officer will determine what actions are required before commencing further operations.

## **11. RESPONSIBILITIES OF PROJECT PERSONNEL**

### Site Supervisor

The Site Supervisor will be Jason Ginter. The Site Supervisor will be responsible for all on-site activities associated with the project. The Site Supervisor will be responsible for implementation of the Site Specific Health and Safety Plan. The Site Supervisor may serve as the Health and Safety Supervisor or may assign this role to a trained individual.



### Health and Safety Officer

The Health and Safety Officer will be Jason Ginter. The HSO has overall responsibility for the implementation of this plan and for approval of any changes or additions to it. The HSO will be responsible for determining personal protection equipment use, identifying hazards, providing material safety data sheets, conducting periodic air monitoring, coordinating with the Site Supervisor on safety issues, documenting all injuries and safety violations and stopping all site activities when a safety violation or potential safety violation could endanger an employee.

The Health and Safety Officer is the site emergency coordinator; the Site Supervisor is the alternate. The emergency coordinator is responsible for:

- assessing the situation and determining whether an emergency exists which requires activating the plan;
- directing all efforts in the area, including evacuating personnel and minimizing property loss;
- ensuring that outside emergency services such as fire departments, police, ambulance, and hospitals are notified when necessary;
- directing the shut-down of site operations when necessary;
- notifying and coordinating with regulatory agencies as necessary.

## **12. PERSONNEL TRAINING**

All **NORTECH** employees who work at hazardous sites will have completed an initial 40-hour and annual 8-hour refresher hazardous waste site and emergency response (HAZWOPER) training program as required by OSHA 29 CFR 1912.120. All **NORTECH** employees identified as site supervisors will receive an additional eight hours of HAZWOPER Supervisor training.

**NORTECH** employees will be given emergency response training in site evacuation, first aid, and use of fire extinguisher and emergency notification equipment.

If an accident happens, **NORTECH** will provide specific training to minimize the chance of a recurrence.



### 13. MEDICAL SURVEILLANCE PROGRAM

Medical surveillance for personnel will be in accordance with current state Occupational Safety and Health Administration (OSHA) directives. The program will be instituted for 1), employees who may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or above published exposure levels for 30 days or more without regard to the use of respirators; 2), all employees who are required to wear a respirator for 30 days or more a year; and 3), all employees who are injured, become ill or develop signs or symptoms due to possible exposure involving hazardous substances or health hazards from hazardous waste operations or emergency response.

### 14. PERSONAL PROTECTIVE EQUIPMENT

Proper personal protective equipment (PPE) is required to protect against the known or potential hazards at work sites. PPE will be selected based on the types and concentrations of substances anticipated at sites. **The Site Supervisor, in consultation with the Health and Safety Officer, has determined that the normal PPE for these types of project and petroleum fuels often associated is Level D. Higher levels may be required if unexpected contamination is discovered. When the HSO finds petroleum contamination at a site, the HSO will set up the Exclusion Area in which PPE will be worn.**

**At all times, PPE** will include steel-toed rubber boots and safety glasses. Hard hats will be worn when working around heavy equipment in areas where objects or rocks may fall on you or chains or cables may snap.

**Level D: requires:** coveralls or impervious raingear, such as Helly Hansens or equivalent; hard hat; rubber boots such as Xtra Tuffs or equivalent or shoes with leather or chemical-resistant, steel toe and shank; safety glasses or splash goggles; chemical resistant gloves; **optional:** hearing protection and half-face air purifying respirators with cartridges equipped (MSHA or NIOSH approved) for organic vapors.

**Level C: requires:** hard hat; air purifying respirator-full face, cartridge equipped (MSHA or NIOSH approved); chemical resistant clothing (hooded, one-piece or two-piece splash suit); chemical resistant coveralls; outer and inner chemical-resistant gloves; **optional:** long cotton underwear, boots (outer) chemical resistant, steel shank, escape mask, hearing protection.

**Level B: requires:** hard hat; supplied air respirator (MSHA or NIOSH approved), respirators may be pressure demand self contained breathing apparatus or pressure demand air line (with escape bottle for IDLH or potential IDLH atmosphere); chemical



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resistant clothing, hooded one or two piece splash suit, and disposable chemical resistant one piece suit (Saranex); long cotton underwear; outer and inner chemical-resistant gloves; boots (outer) chemical resistant steel toe and shank; **optional:** chemical resistant boot covers (disposable); hearing protection; two-way radio.

Level A: **requires:** supplied air positive pressure; fully encapsulating chemical resistant suit and all other equipment as Level B.

## 15. SITE CONTROL PROCEDURES

Access to the project site activities will be limited to authorized personnel such as **NORTECH** and Lakloey, Inc employees, designated equipment operators and local, state and federal officials. Zones of operations will be established and identified with barrier tape or physical barriers. Signs will be posted identifying restricted areas. The zones of operations include the following.

### Exclusion Zone

The Exclusion Zone is the area where oily soil and hazardous materials (or the containment structures for storing hazardous materials) are being **removed, sampled, stored, treated or remediated**. The Exclusion Zone for these projects generally consists of the excavation area from which contaminated soil is being removed and the stockpile areas. Exclusion Zones also include remediation sites where hazardous materials are placed for treatment. There will be no eating, drinking, smoking or horseplay in Exclusion Zones. The buddy system will be used at all times in the Exclusion Zone.

### Chemical Reduction Zone

The Chemical Reduction Zone will be adjacent to the Exclusion Zone. All decontamination procedures for employees, for personal protective equipment, tools and heavy equipment shall be conducted in this zone. Separate entry/exit decontamination stations for heavy equipment will be established when possible. The buddy system will be used at all times.

### Support Zone

The Support Zone will be located next to the Chemical Reduction Zone and is considered an uncontaminated or clean zone. The Support Zone should be located upwind from the Exclusion Zone and Chemical Reduction Zone. First aid stations, emergency communications, food and water will be located in the support zone. The Health and Safety Officer will monitor the Exclusion Zone and the Chemical Reduction Zone to ensure the personnel do not enter without proper personal protection



equipment.

## **16. DECONTAMINATION PROCEDURES**

Employees may come into contact with contaminated soil and become contaminated. Each time an employee enters the Contamination Reduction Zone from the Exclusion Zone, he/she must make a thorough self-examination. Efforts will be taken to avoid "tracking" of contaminants outside the Chemical Reduction Zone. The Health and Safety Officer will monitor all decontamination activities to determine their effectiveness.

### Simple Decontamination Procedures

All decontamination will be accomplished in the Chemical Reduction Zone unless there exists an immediate threat to life. All efforts must be made to minimize the spread of contamination. Mild household soap such as Dawn will be used for decontamination. No solvents will be used for skin decontamination. Employees will be encouraged to maintain extra personal clothing at sites. Disposable items will be collected and disposed appropriately. First aid kits and eyewash will be available at the decontamination station. A means to control runoff/spill of decontamination solution to prevent further site contamination will be established as necessary. Ancillary personnel such as community medical staff will be immediately informed of the type of contamination and hazards information provided.

### Equipment Decontamination

Decontamination of equipment is essential to avoid spread of contamination to clean areas. Key elements in decontamination are inspection and washing. The latter may require high-pressure detergent solution application, depending on the level of soil and contaminant attachment. Any items taken into the Exclusion Zone will be assumed to be contaminated. In general, vehicles, equipment, and materials brought into the Exclusion Zone will remain in the Exclusion zone until no longer necessary to the project. All contaminated vehicles and equipment will be decontaminated before they are taken off-site. Controls will assure that contaminated items do not leave the Exclusion Zone without proper decontamination.



**COMPLIANCE AGREEMENT**  
Health and Safety Plan Compliance Agreement

I have reviewed a copy of the Safety and Health Plan for Site Corrective Action via excavation. I understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on a project for violating any of the safety requirements specified in the plan.

Signed:

_____ (signature)	_____ (date)
_____ (signature, Site Supervisor)	_____ (date)